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ABSTRACT

Children from low-income, ghetto, and minority groups tend to display a low level of performance in school and evaluated themselves as worse than most students on their school performance. This study examines the impact of self-concept on academic achievement. It was hypothesized that: (1) reinforcement of behaviors important to academic success increases achievement; (2) as academic achievement improves, academic self-concept becomes more positive; and, (3) social rewards (verbal and written praise) are more effective than economic or token rewards (small amounts of money) in improving academic achievement. Forty-two black students with scores below the average of their class on achievement and self-concept measures were selected for this study from grades four, five and six in one school. Teachers rated the students' intellectual development on a four-point scale both before and after treatment. The students were randomly assigned to one of three treatment groups for 12 weeks. Group one received intensive tutoring and counseling combined with token reinforcement. Group two received intensive tutoring and counseling combined with social reinforcement. Group three received no counseling or reinforcement. The subjects were pretested on academic and self-concept measures, received their respective treatments, and were retested. The tutoring-counseling was carried out by the experimenter in one-hour sessions twice a week for each group. (Author/JM)

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IN TEACHING

Technical Report No. 38

THE EFFECT OF COUNSELING AND REINFORCEMENT ON BEHAVIORS IMPORTANT TO THE IMPROVEMENT OF ACADEMIC SELF-CONCEPT

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INTRODUCTORY STATEMENT

The Center's mission is to improve teaching in American schools. Too many teachers still employ a didactic style aimed at filling passive students with facts. The teacher's environment often prevents him from changing his style, and may indeed drive him out of the profession. And the children of the poor typically suffer from the worst teaching.

The Center uses the resources of the behavioral sciences in pursuing its objectives. Drawing primarily upon psychology and sociology, but also upon other behavioral science disciplines, the Center has formulated programs of research, development, demonstration, and dissemination in three areas. Program 1, Teaching Effectiveness, is now developing a Model Teacher Training System that can be used to train both beginning and experienced teachers in effective teaching skills. Program 2, The Environment for Teaching, is developing models of school organization and ways of evaluating teachers that will encourage teachers to become more professional and more committed. Program 3, Teaching Students from Low-Income Areas, is developing materials and procedures for motivating both students and teachers in low-income schools.

This report deals with work done in the Reinforcement Strategies component of the Program on Teaching Effectiveness. The purpose of the component is to delineate teaching skills that contribute to enhanced school achievement by young, black, disadvantaged children.

ABSTRACT

Children from low-income, ghetto, and minority groups tend to display a low level of performance in school and evaluate themselves as worse than most students on their school performance. This study examines the impact of self-concept on academic achievement.

Three hypotheses were set forth: (1) Reinforcement of behaviors important to academic success increases achievement. (2) As academic achievement improves, academic self-concept becomes more positive. (3) Social rewards (verbal and written praise) are more effective than economic or token rewards (small amounts of money) in improving academic achievement.

Forty-two black students with scores below the average of their class on achievement and self-concept measures were selected for this study from grades 4, 5, and 6 in one school. Teachers rated the students' intellectual development on a four-point scale both before and after treatment. The students were randomly assigned to one of three treatment groups for 12 weeks. Group 1 received intensive tutoring and counseling combined with token reinforcement. Group 2 received intensive tutoring and counseling combined with social reinforcement. Group 3 received no counseling or reinforcement.

The subjects were pretested on academic and self-concept measures, received their respective treatments, and were retested. The tutoring-counseling was carried out by the experimenter in one-hour sessions twice a week for each group. Tutoring was in arithmetic and reading. The experimenter provided token reinforcement; social reinforcement was provided by both the experimenter and the teacher.

The analysis of variance of the reading data shows that after adjustment for pretest differences, Group 2 (social reward) improved significantly as compared to Group 1 (token reward) and Group 3 (control). The findings for Group 2 on the reading variables support two of the major hypotheses (1 and 3). The results of the analyses of the arithmetic, self-concept, and teacher rating data, although not significant statistically, are in the predicted direction. The results indicate that teachers need to know what social rewards are valued by their students. Appropriate treatments in schools attended mainly by poor or black children should include counseling and advisory services for elementary grade students.

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CHAPTER I

INTRODUCTION: PROBLEM AND RATIONALE

The problems of educating children from low-income, ghetto, and minority groups have presented an overwhelming challenge for researchers and educators. Hundreds of educational interventions have been tried with an equal number of educational outcomes. These interventions, their outcomes, and their antecedents add further complications to the problems because they interact with the many situational determinants operating on children and influencing their learning.

Modern psychological theory places high value on the possible influence of the self-concept (Rogers, 1951; Combs, 1963; Snygg, 1959; Coopersmith, 1967; and Goffman, 1959). The development of an individual's self-concept is believed to be one of the most important aspects of human experience. Educators concerned with growth and development in children have become concerned with the influence of self-concept, but the investigations have been limited mainly to correlational relationships between self-concept and other variables (e.g., academic achievement). Research designed to manipulate behavior variables experimentally and measure changes in self-concept has seldom been done. This study attempts to identify some of the effects of the systematic application of token and social reinforcement and counseling

on academic behaviors. Most of these academic behaviors have a low frequency of occurrence in low academic self-concept children.

Self-Concept

William James (1890) was first to introduce the concept of self to American psychology. He viewed the self as the sum of all that can be called one's own, including body, clothing, home, wife, children, psychic processes, and recognition received from others (social self).

Coopersmith (1967) defined the "self" as an abstraction that an individual develops about his own attributes, capabilities, objects, and activities. The abstractness is represented by the symbol "me," which is a person's idea of himself. The self may be viewed as an organization of perceptual hypotheses for meeting life, an organization which has been relatively successful in meeting the needs of the individual.

For Snygg and Combs (1959) and Mead (1934), as the individual interacts with his environment, the self becomes defined, differentiated, and symbolized in his conscious awareness. Not only is the self differentiated in accordance with his experience, but the individual may accept the feelings and experiences of others as though they were his own. This is especially true in the case of others who are regarded as highly important to the individual. Often he may learn to perceive himself as he thinks others close to him perceive him.

Sears (1963) held that the self-concept is complex, made up of many facets, with each facet differing in importance or reward value

from the others. Expectancies have been learned for each facet, so that the individual can predict his success or failure in behavior that pertains to a given facet. These expectancies have been acquired and can be changed according to principles of learning.

The terms "self-concept" and "self-esteem" have been used to refer to many diverse conceptions. Rogers (1951) defined self-concept as an organized configuration of perceptions of the self which are admissible to awareness. It is composed of such elements as the perceptions of one's characteristics and abilities; the percepts and concepts of the self in relation to others and to the environment; the value qualities which one perceives as associated with experiences and objects; and goals and ideals which one perceives as having positive or negative value. For Rogers, the term "self" and "self-concept" are used interchangeably, and always refer to the person's view of himself.

In Rogers' analysis, the self has characteristics. It develops as an outgrowth of the organism's interaction with the environment. It introjects the values of other persons, particularly those who are significant others. The self strives for consistency. A person behaves in ways which are consistent with how he sees himself. Experiences which are not consistent with the self are perceived as threats and are either distorted or denied. The self may change as a consequence of maturation and learning. If a person's primary motivation is for self-consistency and congruency, the organism tends to keep experiences that are not consistent with the self from becoming conscious, while at the same time the self selectively chooses experiences that are consistent

with its structure.

The self is a differentiated segment of one's phenomenal field. (A phenomenal field represents each person's experiential frame of reference.) The self consists of a pattern of conscious perceptions and values of the "I" or "me." Rogers (1959, p. 200) believed the self-concept refers to:

> the organized, consistent conceptual gestalt composed of perceptions of the characteristics of the 'I' or 'me' and the perceptions of the relationships of the 'I' or 'me' to others and to various aspects of life, together with the values attached to these perceptions. It is a gestalt which is available to awareness though not necessarily in awareness. It is a fluid and changing gestalt, a process, but at any given moment it is a specific entity.

Rogers observed that the individual not only has expectancies and a perceived self, but he also has an ideal self. This construct of the ideal self is defined as the self which the individual would most like to possess and upon which he places the highest value of himself.

For the purpose of this study, self-concept is defined as consisting of the following: 1) the perception of one's characteristics and abilities; 2) the way one perceives of his "self" in relation to significant others and his environment; 3) the way values are perceived as associated with experiences and objects; and 4) goals and ideals which are perceived as being positive or negative.

Perceptions of one's self and of the world around play a crucial role as causative agent in the formation of the behaviors of children (Combs and Snygg, 1947). Such perceptions produce behaviors which reflect those perceptions. Behaviors exhibited in reading, singing, or

studying mathematics can be important indicators of one's self-concept. If this analysis is correct, understanding ways of modifying behaviors --using specific reinforcement strategies or counseling to improve the behaviors relevant to academic self-concept--could be important in the development of teacher-training programs, curriculum planning, and school counseling programs.

The Relationship between Self-Concept and Achievement

A number of studies have demonstrated a correlational relationship between "self-concept" and the academic achievement of elementary school, junior and senior high school, and college students (Jersild, 1952; Reader, 1955; Stevens, 1966; Brookover, 1964; and others). Self-concept in each of these studies was found to be significantly correlated with academic achievement. High academic achievement was accompanied by high self-concept.

For example, Bledsoe (1964) studied the correlation between self-concept and achievement among fourth and sixth-graders. He found girls averaged significantly higher than boys on both self-concept and achievement measures. The fourth and sixth-grade boys and girls rated themselves on a self-concept scale and a child self-description scale. The achievement of the four groups was also measured. The rank order of the means from lowest to highest in both self-concept and self-ideal concept was fourth-grade boys (N=65), sixth-grade boys (N=76), fourth-grade girls (N=60), sixth-grade girls (N=70). The variability of boys on both measures was greater than that of girls at both grade levels.

The mean scores for girls on the California Achievement Test were slightly higher than those for boys in all subjects except arithmetic fundamentals at the fourth grade level. The correlations between self-concept and achievement at the fourth and sixth grade levels were positive for both boys ($r = .52$) and girls ($r = .27$), but significant only for boys.

Working with 510 fourth through sixth-graders, Anastasiow (1967) examined the relationship between School and College Ability Test (SCAT) scores and self-concept as to mental ability and school subject proficiency. He found that boys who had low SCAT scores also had significantly lower self-concept scores in the two areas, mental ability and school subjects. The same was true for girls. The girls who were low on the SCAT were also significantly lower than the low ability boys on self-concept as to mental ability and physical ability.

Fink (1962) compared 20 pairs of boys and 20 pairs of girls at the sixth grade level matched on the basis of CTMM I.Q. and sex. He found a significant relationship ($p < .01$) between self-concept and academic achievement for boys, but not for girls ($p > .05$).

Spaulding (1964) further supported the association of negative self-evaluation with lower girls' achievement test scores. He found that a teacher's negative criticism of a child in a classroom was associated with lower classroom achievement and presumably with lower self-evaluation for girls but not for boys. Some of the above studies indicate that not doing well in school has a stronger association with the lower self-esteem of girls than of boys. The studies reported above

are a limited sample of the studies concerning children's perceptions of themselves and their abilities in school as measured by different self-concept scales and achievement measures. These studies support the hypothesis that there is a significant positive correlation between self-concept and academic achievement.

Assumptions Underlying the Present Study

This study is based upon the following assumptions as to the nature of self-concept:

1) Self-concept can be expressed in behavioral terms, and the behaviors can be changed by experimentally manipulating personal or environmental variables. These changes in behavior will bring about a change in self-concept.

2) There is a significant relationship between self-concept and behavior.

3) Counseling can significantly aid in the acquisition of behaviors relevant to the self-concept.

4) Reinforcement techniques can be effective in changing established behavior patterns.

Each of these assumptions is discussed in what follows.

(1) Experiments in Changing Self-Concept

Self-concept (behaviorally defined) can be changed by experimentally manipulating personal or environmental variables. Videbeck (1960) found that short-term changes in self-concept can be induced by having someone who is viewed as an expert by the subjects make evaluation

statements while the subjects are performing a task. While the subjects performed reading tasks, negative evaluations by the experts caused significant negative changes in the self-concept of the subjects, without a corresponding significant positive change in self-concept when the same experts gave positive ratings to the subjects. Maehr (1962) attempted to replicate Videbeck's study. He had subjects rate themselves on a nine-point physical ability scale (ranging from "extremely adequate" to "extremely inadequate") in regard to body coordination and agility. The ratings were made on athletic skills (related items) and on physical fitness in general (unrelated items). The criticized items corresponded directly to the evaluations to be given by the significant others. He reported an improvement in self-concept rating when significant others made approval comments and a decrease in self-concept rating when disapproval statements were made. In short, both Videbeck and Maehr found negative and disapproving statements made by significant others to be accompanied by a decrease in the self-concept ratings of subjects.

Penna-Firme (1969) studied the effects of social approval and reinforcement on self-esteem. Working with Mexican-American school children, she used approval statements and rewards (Mexican hats, foods, etc.) which were valued in Mexican cultures and homes. She believed rewards valued in the Mexican culture and received in the home would be more effective in bringing about positive changes in self-concept than would rewards which were not a part of the cultural background of Mexican-American children. Although the results did not

indicate a significant change in self-esteem, Penna-Firme's study was important because she found that rewards closely associated with the culture of the children were more effective in changing low self-esteem children than they were in changing high self-esteem children. High self-esteem children had higher achievement scores when rewarded with "American" rewards than when rewarded with "Mexican" rewards. The American rewards had a negative effect on the low self-esteem children. This study of observable changes in behavior and self-esteem indicated that differential rewards are necessary to maximize the effects of reward systems.

Thus, the limited research available indicates it is possible to change self-concept by experimentally manipulating personal and environmental variables. Also, the research indicates that differential reward systems make the experimental manipulation of personal and environmental variables easier and faster.

(2) The Relationship between Self-Concept and Behavior

That there is also a significant relationship between self-concept and behavior is indicated by the studies reported by Videbeck, Maehr, and Penna-Firme. Those studies further justify using behaviorally based definitions of self-concept. The literature on self-concept points out the many difficulties encountered in dealing with the variable in research settings. Combs (1963) suggested the need to limit self-concept analysis to clear instances of behavior that the child can observe in himself just as he can observe those behaviors in others. Some of the studies reviewed above indicate that, when stimuli (e.g.,

evaluations by significant others, or rewards from Mexican culture) act upon the subject, a change in self-concept takes place. The change in self-concept should be accompanied by a change in the behavior patterns of the subjects.

What are the accompanying changes in behavior? Is it possible to identify behaviors specific to social self-concept or academic self-concept? Reeder (1955), in her work with middle-grade children, investigated self-concept as represented by behavioral manifestations and achievement in academic situations. Her subjects were asked to rate themselves (compare themselves with their peers), and their teachers and peers rated the subjects (ranked them from most to least influential among peers). The subjects were matched on intelligence test scores and then were divided into high and low self-concept groups. Children with a low self-concept (1) had lower sociometric status, (2) achieved lower in comparison to their potential, and (3) were more frequently classified by teachers as having behavior problems than those with high self-concept. Benjamin (1950) found another kind of relationship between self-concept and behavior. His investigation indicated that self-concept can be changed through false ranking, and that one can predict the direction of change in performance on a second test. Using a group of 48 high school students, he obtained their perceptions of their own rank on intelligence within their class. The students were then given an intelligence test and were falsely ranked on their performance. The second ranking of the students predicted the direction of change on the intelligence test. The correlation

between the second ranking of the students and the direction of change was r = .43. Although Benjamin's study lacked an adequate description of methodology and also lacked a control group, it implied that it is possible to alter a person's perception of himself as a performer and thus not merely predict but actually influence the direction of the change in actual performance.

If perceived performance change changes self-concept, the existence of a relationship between self-concept and behavior is further substantiated. To begin to answer questions similar to those posed above and isolate some of the behaviors and their relationships to self-concept are goals of this study.

3) Counseling as an Aid in Changing Behavior Relevant to the Self-Concept

Counseling can significantly aid in the acquisition of desirable behaviors. Bosdell (1962), in a review of the research dealing with the effects of counseling on the achievement of underachieving adolescents, found the majority of studies did not reveal any significant improvement on achievement variables after group counseling. But the literature reviewed by Bosdell did reveal some significant effects overall. At least the research indicated a trend in the positive direction for the effects of individual counseling on academic achievement. Bosdell was successful in raising academic achievement using individual counseling and study skills instruction in her own study. Although self-concept was not measured and reported in the studies reviewed by Bosdell, the techniques used in those studies are viewed

as important to the success of the present study. Counseling on individual problems as well as counseling aimed at academic improvement of the group will be an important part of the treatment in this study.

(4) Effectiveness of Reinforcement Techniques in Changing Behavior Patterns

Reinforcement techniques can be valuable tools for changing established behavior patterns. Martin (1970) reviewed research on reinforcement and the reduction of disruptive classroom behavior.

Social Reinforcers. He reported that when Becker, Madsen, Arnold and Thomas (1967) made teacher attention and praise contingent upon academic behavior in full classrooms, the amount of classroom disturbance (talking out of turn, turning in seats, talking to others, etc.) decreased. Two children from each class were selected for treatment on the basis of observer reports of disruptive classroom behaviors. The children selected had the highest baseline rate of disruptive behaviors. The disruptive behavior for the ten children in the five classes was 62 per cent during the baseline period and 29 per cent during the experimental period, a change significant beyond the .001 level. All children showed less deviant behavior during the experimental phase.

Hall, Lund, and Jackson (1968) increased study behavior by making teacher attention contingent only upon study activities of the students. Once a baseline rate of study and disruptive behavior had been established for disruptive children, the observers, using a hand signal, told the teacher to reinforce the study behaviors which they

observed in the target disruptive students. Upon signal the teacher attended to the children by moving to his desk, making some verbal comment, giving the child a pat on the shoulder, or the like. When teachers were thus cued to attend to desired study activities of students, the study behavior significantly increased in frequency of occurrence. By keeping teachers from attending to disruptive behaviors, the experimenters found that the rate of those behaviors decreased significantly. Also, the disturbance behavior could be increased by changing the focus of the teacher's rewarding behavior from study behavior to disruptive behavior.

In a series of studies carried out in pre-schools, Harris, Wolf and Baer (1964) demonstrated the effectiveness of contingent teacher attention in modifying behavior problems of pre-school children. In these studies inappropriate or undesirable rates of isolate play (Allen, Hart, Buell, Harris, and Wolf, 1964), and a number of other problem behaviors, were modified by systematically manipulating teacher attention. Similarly, in special classrooms, teacher and peer attention were manipulated by Zimmerman (1962), Patterson (1965), and Hall and Broden (1967) to reduce problem behaviors and increase appropriate responses of children enrolled.

Martin (1970) contended that the above findings and similar findings not reviewed here amply support the contention that social reinforcement dispensed by the teacher can control the behaviors of children.

Token Reinforcers. In numerous studies intended to change

behavior, token reinforcement has been used. Token reinforcement is the providing of physical objects, when a desired behavior has occurred, which later may be exchanged for privileges, money, or for items normally purchased with money. Carlson, Arnold, Becker, and Madsen (1967) were successful in using token reinforcement to eliminate temper tantrums in children. Working with one child who consistently exhibited tantrum behavior, these researchers rewarded the class with treats when they were able to ignore the temper outbursts of the disruptive child. The aim was to withdraw peer attention from the tantrum behavior. These researchers rewarded the child subject with a star on the activity board for each half-day of non-tantrum behavior. The child was promised a party when four stars in a row were obtained.

The program began on March 14 and continued through June 10. On May 9, the researchers suggested extending the required stars from four to six. The subject had one tantrum on March 14, the morning the program began. There were none the rest of the week. Three more tantrums occurred between March 14, and April 29. None occurred from May 1 to June 10 when school ended. Before the treatment, tantrums had been a daily occurrence.

Tyler and Brown (1968), working with a group of institutionalized delinquent boys, effectively raised academic achievement by applying token reinforcement strategies. Working with a group of court-committed boys, aged 13 to 15, in a training school, these researchers had the subjects observe a daily television newscast. The following morning in school their teachers administered a 10-item true-false

test based on program content. The subjects were immediately shown their scores. After school, the subjects were paid tokens redeemable for candy, gum, etc.

During Phase I (17 days), Group 1 (N = 9) received tokens on a non-contingent (straight salary) basis. During Phase II (12 days), Group I received non-contingent reinforcement, and Group 2 (N = 6) received contingent reinforcement. Both between-groups and within-groups data clearly indicated that contingent reinforcement was associated with higher test performance than was non-contingent reinforcement. This pattern emerged in spite of the use of quickly prepared unstandardized test items which varied considerably in difficulty from day to day and in spite of unstable conditions such as a shifting institutional population.

Various approaches have been suggested for motivating children who are underachievers in school. As Birnbrauer, Wolf, Kidder, and Tague (1965) have indicated, these include (a) the use of intrinsically reinforcing materials which are interesting and meaningful, (b) materials and procedures which combine interest value and high probabilities of success and, finally, (c) presenting social and symbolic reinforcers, e.g., teacher approval, grades, and stars. These researchers point out that none of these methods may be adequate for children who are retarded in their learning, for school dropouts, or for children with behavior problems. They suggest that token reinforcement systems may be more effective with such children. In such systems the tokens, which are exchangeable for tangible reinforcers, become generalized reinforcers

(Skinner, 1953). The studies reported above are but a few of the studies using token reinforcement systems which have strengthened academic performance and reduced behavioral disruptions in classrooms (see O'Leary and Drabman, 1971).

The results of the above studies indicate that token reinforcement can significantly alter both social and academic behaviors in children. Tokens are easily used in shaping behaviors, and can be used to provide effective motivation in those instances where social reinforcement or other naturally occurring reinforcers are insufficient in altering behaviors.

None of the studies reported above has attempted to use reinforcement strategies to enhance specific academic behaviors and measure the accompanying change in self-concept. The findings reported in the literature reviewed indicate that (1) self-concept and academic achievement are correlated, (2) self-concept can be changed by manipulating personal or environmental variables, (3) behavior and self-concept are highly correlated, (4) reinforcement techniques can be effective tools in changing behavior.

In this study each of the foregoing propositions is used as a basis for forming testable hypotheses. An attempt is made to specify behaviors which when modified will result in improved academic performance and a higher self-rating on self-concept measures as they pertain to academic achievement.

Nonachievers vs. Underachievers

Most studies on self-concept and achievement are concerned with

the unsuccessful student's problem of underachievement, the "underachiever" being one whose classroom performance tends to be below what would be predicted from aptitudes as measured by mental ability tests. In other words, he is the student who, because of nonintellectual factors, does not perform as well as expected.

Goldberg (1960), in studying underachievers in grades 9-12, had students rate themselves on a list of characteristics and abilities called "How I Am." He found that underachievers perceived themselves as less able to fulfill required school tasks, they were less eager to learn school tasks, and they showed less ambition for school tasks than did achieving students. One is not surprised to find, in a study carried out by Shaw (1961), that underachievers have a more negative self-concept and demonstrate less mature behaviors than their achieving peers.

Fewer studies have considered the "nonachiever," the child who lacks the ability to meet the demands of the school. These children do not necessarily lack the intelligence to perform in school. Rather, these children have never acquired the attitudes needed to acquire the skills, the abilities, and the persistence required to work successfully in the school environment. Their behaviors in the academic areas have been described as fleeting, as unmotivated, and as lacking the "stick-to-itness" necessary to perform well in school, although they may display considerable motivation and persistence in non-academic areas of life (Cohen, Filipczak, and Bis, 1967). The nonachiever is in the unenviable position of lacking the skills and abilities to meet the demands

of the school. He is faced, unless the school makes special arrangements for him, with repeated failure.

The available research indicates that unsuccessful students, whether underachievers or nonachievers, are likely to hold very negative attitudes about themselves and their abilities. These students tend to view themselves as less able, less adequate, and less self-reliant than their more successful peers.

As the literature points out, these attitudes have a profound effect on the student's self-concept. The treatment received from significant others, as they respond to the nonachiever and the underachiever, tends to continue the decline of these students' self-esteem.

It is apparent that the nonachiever, the student who lacks the knowledge of what is required and the ability to do what is required in order to achieve in the school environment, presents a special problem which should be addressed by researchers. As Combs and Snygg pointed out, "The self is the individual's basic frame of reference, the central core, around which the remainder of the perceptual field is organized. In this sense, the phenomenal self is both product of the individual's experience and producer of whatever new experience he is capable of" (1959, p. 146). If so, nonachievers, with low self-concept, are caught up in a vicious circle.

Things are significant or insignificant, important or unimportant, attractive or unattractive, valuable or worthless, in terms of their relationship to oneself. We evaluate the world and its meaning in terms of how we see ourselves. The possibility is great that many

nonachievers fail in school simply because the school and its demands for educational achievement seem irrelevant to the nonachiever and his world.

It is puzzling to some educators and researchers to find that education and achievement in school are highly valued among parents of nonachieving students. Hess (1968) found that working-class mothers of preschoolers expressed stronger feelings for education and relied more upon the educational institutions for the educational direction and development of their children than did middle-class mothers. In the well-known survey by Coleman, et al. (1966), minority groups were found to have a very keen interest in education, but they had the largest percentages of nonachievers and underachievers in the schools examined.

After the home environment, the school environment is the single most important force in shaping the child's self-concept. In the traditional educational setting, the child is expected to adjust to the school rather than have the school adjust to the child (Purkey, 1970). The non-achieving child and the underachieving child are thrown into a competitive school environment which ignores varying social backgrounds and individual differences in knowledge and abilities required for school success.

It is necessary for the school, if non-achieving and underachieving students are to succeed in academic pursuits, to adjust its curriculum and expectations of students in order to meet the educational needs of these students. The question which arises is, What are the needs of these students?

Systems Analysis of the Academic Processes in Schools

In an attempt to determine the kinds of academic behaviors that would be found in an ideal school and how these behaviors would be developed and reinforced in children, a systems-based analysis of the ideal school and the academic behaviors required by the school was carried out by the present author. The systems approach is a practical way of thinking about how all the variables in a given setting interrelate to determine a particular outcome. In employing a systems approach, the educator first delineates the mission (objectives) or problem that he is concerned with accomplishing. After the mission, or problem, has been specified, all the variables that contribute to (or impede) the accomplishment of the mission are specified (Zifferblatt, 1973).

Kennedy (1966, p. 15) defined a system conceptually "as a process which implies a goal or purpose, and which in turn implies interaction and communication between components and parts." The school meets the criterion of a system. The school establishes goals and objectives. Certain behaviors must take place in order for the school and students to achieve those goals and objectives. The school designates personnel and assigns them the task of achieving specific goals (e.g., teaching history, mathematics, science, or reading). Within each of the specific tasks certain other goals must be achieved. The school assigns to each teacher the authority to punish behaviors which are detrimental to the achievement of the school goals and to reward behaviors which contribute to achieving the goals of the school.

The school in setting up its goals and objectives for educating children expects certain behaviors to occur at specific times and locations, involving specific people. If the behaviors occur as the school expects them to occur, the child is rewarded. The rewards are usually presented by the school, or the teacher, or the child's parents. If a breakdown in interaction or communication takes place at any point, the educational process is hampered and the goals of the school are not achieved.

An attempt was made by the present author to discover some of the necessary behaviors, where they might be expected to occur, and who might be responsible for providing the rewards for their occurrence. The educational activities found in a hypothetical ideal school were identified and compared with the educational activities found in the school where the present study was carried out. (Major sources of ideas in the formulation of the "ideal school" were the writings of John Dewey, Franklin Babbitt and Ralph Tyler, as considered by Professor Elliot Eisner of Stanford University, in his course on curriculum theory, in the autumn of 1971.) Each potential learning behavior, e.g., taking notes in class, reading the assigned materials, completing homework, and paying attention in class (see Appendix IV), was listed. Each place where the behaviors could take place, e.g., the home, library, classroom (see Appendix IV), also was listed. The persons who would reward the child for adequately completing each of the behaviors, e.g., parents, teachers, or peers (see Appendix IV) were listed.

This systems-based analysis of the academic behaviors found in

a hypothetically ideal educational environment revealed more than 40 behaviors which should occur in more than ten different settings or locations. The same systems approach, when applied to the school in which this study was conducted, revealed a great deal of discrepancy between the conditions in the hypothetical ideal school and the actual school situation.

It was found that the general goals and objectives of the hypothetical ideal school and the school where this study was carried out were about the same. There were marked differences, however, in the acceptance of objectives, the expectations, and the goals of the students in the two school settings. In the ideal situation, the school's objectives and goals were very close to those of the typical ideal student. In the school where this study was carried out, the goals and objectives of the school were markedly different from those of the students.

Students in the ideal school setting value learning for grades and the approval of teachers and parents. These students study in recognizable, traditional places, e.g., the home, library, and classroom. The students in the actual school used in the study did not value good grades. They did not study in the traditional settings for study. They wanted the approval of the teacher and parents, but not at the expense of losing the approval of their peers.

It was clear, when the ideal school was compared with the actual school, that the learning activities expected by the two schools were generally the same, but the behaviors exhibited toward the learning

process by the students were different. The comparison of ideal behaviors with those observed in the actual school led to the identification and selection of the behaviors to be modified in this study. (A complete list of behaviors, settings, and persons providing rewards can be found in Appendix IV.) The behaviors selected for modification were those behaviors which appeared in the ideal educational setting but were not found in the actual school setting (e.g., studying at the same time every day, reading in the library, or setting a specific time for studying).

The social-cultural expectations of the school are such that the discipline needed for these behaviors will have developed in the child in the years before he arrives at school. The school also assumes that parents are aware of these needed behaviors, and it counts on the parents to continue to develop these behaviors in their children. The behaviors selected for modification in this study are rarely if ever systematically developed by the school. The behaviors are thought to be fairly common among middle class children who are high achievers in school (Hess, 1968). The acquisition of these behaviors is believed to be correlated with high academic achievement. The acquisition of these behaviors may significantly improve the academic achievement of urban school children.

Not all of the academic behaviors identified, not all of the settings for the occurrence of these behaviors, and not all of the possible persons involved in presenting rewards to children, could be investigated in this study. The behaviors selected for study and

modification were selected because they appeared to be most directly related to learning and least attended to by the school curriculum. In the present study, these behaviors were:

1. Assignment writing
2. Asking academic questions in class
3. Reading in the library for a specific amount of time
4. Paying attention in class
5. Setting a time for study at home
6. Completing all homework assignments
7. Studying at the same time each day
8. Entering the classroom quietly
9. Studying reading and arithmetic outside of class for a specified amount of time each day
10. Working to attain a goal of 80 per cent correct on required work.

The effects of attempts to modify the above behaviors will be observed in terms of changes in academic achievement and self-concept. Achievement will be measured with the Comprehensive Test of Basic Skills. Self-concept will be measured with the Sears Self-Concept Inventory. The treatment will consist of tutoring-counseling sessions aimed at modifying behavior. The attempt at behavior modification will be based on principles of operant conditioning, e.g., providing reinforcement immediately after a desired behavior has occurred.

Summary

The general purpose of this study is to examine the effects of

social and token reinforcement combined with tutoring and counseling upon the academic achievement and self-concept of low achieving, low self-concept black children. The unique aspect of this study is the attempt to improve achievement and hence self-concept by manipulating academic behaviors experimentally.

Three hypotheses were set forth: (1) Social or token reinforcement of behaviors identified as important to academic success increases achievement. (2) As academic achievement improves, academic self-concept becomes more positive. (3) Social rewards are more effective than economic or token rewards in improving academic achievement.

Briefly, the rationale underlying these hypotheses is as follows: (a) If a desired behavior has a low frequency of occurrence, the application of reinforcers will increase the likelihood of the behavior being repeated by the subject. This is true for reinforcers, whether they are social or token reinforcers. (b) If the first hypothesis is borne out and the frequency of the academic behaviors does increase, academic achievement should improve. (c) The correlation between self-concept and academic achievement has already been established. The attempt here is to begin to isolate the causal effect, that is, to attempt to determine whether improved academic achievement changes self-concept or whether, regardless of improved academic achievement, academic self-concept remains unchanged. (d) Social rewards will be more effective than token rewards among black pupils because of the high value placed by such pupils on social acceptance and approval.

Lower class children generally display in school a low level

of academic achievement which is frequently accompanied by low self-esteem as to academic ability. On the bases of reported research studies which have yielded significant correlations of self-concept and academic achievement, academic achievement was chosen as an important variable to manipulate in attempting to change self-concept. The manipulations of academic behaviors are to be accomplished by using social rewards (e.g., expressions by the teachers and the experimenter, such as "Very good," "I like that," "That's a good job," or a pat on the back) and token rewards (e.g., $1.00 per week). The reviewed literature indicates that positive results should be achieved by using both techniques.

The reviewed literature on self-concept and achievement indicated significant sex differences. But no prediction was made concerning sex differences in the present study, although the investigation of sex differences in the response to the treatments was considered important to this study.

CHAPTER II

METHOD

In this chapter are presented, first, an overview of the methods and procedures used in testing the hypotheses of the study, and then a more detailed description of the sample, treatments, and instruments.

Overview

A sample of black elementary school students with scores below the average on achievement and self-concept measures was selected for this study. The students were randomly assigned to one of three treatment groups. In Group 1 subjects received intensive tutoring and counseling combined with token reinforcement. In Group 2 subjects received intensive tutoring and counseling combined with social reinforcement. Group 3 received no counseling or reinforcement.

The effects of the treatments were studied in a 3x2, group by test occasion, design. The subjects were pretested on academic and self-concept measures, received their respective treatments, and were posttested on the same measures.

The two different experimental treatments consisted of (a) tutoring-counseling plus token reinforcement, and (b) tutoring-counseling plus social reinforcement. Treatments common to both groups were

tutoring-counseling and reinforcement. The treatment specific to Group 1 was token reinforcement. The treatment specific to Group 2 was social reinforcement. The treatment specific to Group 3 was no tutoring-counseling or reinforcement; Group 3 engaged in planning for a better physical education program at the school.

Procedure

Population and Sample

The original sample of subjects for this study consisted of 48 black students drawn from the fourth-, fifth-, and sixth-grade classrooms (a total of eight classrooms) in a public elementary school near Stanford University. The school is located in a predominantly black community. Approximately 99 per cent of the student population at the school was black, with a teaching staff which was about 75 per cent white. The students were selected from the population of all those in the school who fell in the lower half of their class in academic achievement as measured by the Comprehensive Test of Basic Skills (CTBS) and the lower half of their class on academic self-concept as measured by the Sears Self Concept Inventory. A sample of 48 subjects were selected and randomly assigned to one of three treatment groups: token reward, social reward, and control. None of the subjects was in a special class. The school records indicated that the subjects were within the normal IQ range (85-105) and ranged in age from nine to thirteen years.

Each student was asked to sign a statement in which he or she promised to work diligently and make a conscientious effort to improve

himself academically. (See Appendix VI for the complete statement.)

The community from which the subjects came was considered low-income. All but a few of the parents were considered to be "working" class. The black professionals who live in the community typically send their children to schools outside the community.

Table 1

Grade and Sex

	4th Grade		5th Grade		6th Grade		Totals
	Male	Female	Male	Female	Male	Female	
Group 1	3	2	1	1	4	2	
N =	5		2		6		13
Group 2	3	3	0	3	5	1	
N =	6		3		6		15
Group 3	2	3	2	1	5	1	
N =	5		3		6		14
Total N	16		8		18		42

The school was well-established, with a teaching staff with average credentials, adequate teaching materials, and modern techniques and equipment. The fact that the school district was in the process of establishing new goals and objectives caused some difficulty for the

school management. The salary paid the staff was among the lowest paid any school district in the public schools of the surrounding area.

The school where this study was carried out had been involved in a program directed by Dr. Pauline S. Sears of the Stanford Center for Research and Development in Teaching. All of the teachers in the school were engaged in a continuing program directed toward improving teacher effectiveness. Beginning a week before school opened for the 1971-1972 school year, a week-long workshop was held. Teachers were instructed in the use of rewards to improve student motivation, in techniques for controlling student behavior problems, and in methods useful in eliminating anti-social behavior without resorting to corporal punishment. On the basis of the teachers' attendance at the workshop and their use of opportunities for weekly conferences, the staff under Dr. Sears judged that the Stanford program was well accepted by the teachers and administrators of the school.

The study reported on here was explained and described for the teachers and staff of the school in mid-December 1971 in approximately the following terms:

> Commencing about the middle of January and continuing for twelve weeks, we will be examining the effects of working directly with a group of students in an effort to improve academic achievement. Up to this point we have been attempting to change students' academic behaviors by working indirectly through your efforts. The results so far have been outstanding. We are interested in

> discovering if, by working directly with a group of students, we can improve and speed up their academic achievement and self-concept development. The same techniques of motivation that you have been instructed to use in your classes will be used in this program. You are an important part of this study because you will be asked to administer social rewards for successful completion of academic behaviors in your classrooms.

The investigator's impression was that the eight teachers whose students were involved were enthusiastic about the program. They seemed pleased that students who were "losers" in both academic and self-concept categories were being given special attention. At a later date, the record-keeping techniques, academic behaviors, and reward procedures were explained to the teachers and the administrative staff. The teachers were highly cooperative throughout this study.

The 48 subjects had been members of a much larger group of students given the Sears Self-Concept Inventory and the Comprehensive Test of Basic Skills in the fall of 1971. The six students from each of the eight classrooms included in the study who scored lowest in the two measures were randomly assigned to one of the three treatment groups. No more than two subjects from each classroom were assigned to any one treatment group. The total in each group was 16 subjects. The sex and classroom assignment of the students were not factors in the experimental treatments. The reassignment of six students to other schools within the district left 42 subjects of the original 48 (13 in Group 1, 15 in Group 2, and 14 in Group 3).

Treatment

All of the experimental treatments were conducted by the principal investigator, a black doctoral candidate at Stanford University. Two weeks before the treatment began the experimenter met with each group of subjects. The subjects were given a list of behaviors to be modified. They were asked each day, during the two-week period, to report to a conference room at the school and check the academic behaviors they had performed the previous night. The behaviors were recorded by the student checking a box opposite the behavior. They also were asked to list television programs they had watched during the same night at home.

A frequency count of the behaviors was kept and recorded for each student. These data were used to establish the baseline frequency of academic behaviors for each subject. (See Appendix VII, the form used in collecting from each student his record of his "learning activities" last night.)

The experimental treatments began in mid-January, 1972. The experimental treatment lasted for 12 weeks, with posttesting at the end of the treatment. The experimenter met with each of the three groups for two hours per week. Group 1, the token reward group, met on Mondays and Thursdays; Group 2, the social reward group, met on Tuesdays and Fridays; and Group 3, no reward, met on Mondays and Wednesdays. The groups met for one hour on their assigned days.

The subjects were taken out of their regular classrooms and placed in a separate room for the treatment. Groups 1 and 2 received

the same treatment, except for reward, for the 24 sessions.

All of the sessions for Groups 1 and 2 included:

1. Reading activities, tutoring or counseling, one hour per week
2. Arithmetic activities, tutoring or counseling, one hour per week
3. Experimenter-presented token rewards for Group 1 each Monday, and a 15-minute social-activity reward for Group 2, during the last 15 minutes of the session each Friday.

Rewards were given to those who performed the assigned academic behaviors to criterion levels. The criteria for each of the behaviors were established on an individualized basis. Each student determined for himself what he or she felt was a reasonable and achievable goal. That goal became the required criterion to be achieved.

In Group 1, the token group, tokens were a reward each week at a rate which could equal $1.00 per week, i.e., approximately ten cents for each of the completed ten behaviors per week. This procedure made it possible for subjects to receive rewards without completing every behavior to the established criterion levels.

There was a mixture of social and token rewards for subjects in Group 1. Teachers, for example, did not withhold praise when those students earned it in class.

Subjects in Group 2, the social reward group, received praise from the experimenter in the group meetings and from the teachers in the classrooms. Teachers were asked to make complimentary notes on

the students' papers (e.g., good, outstanding, or smiling faces). The teachers were also asked to make a special effort to praise students in the social reward group verbally every day as soon as appropriate academic behaviors were exhibited.

The tutoring-counseling sessions were intended to be a way of helping the child resolve problems he or she may have encountered as new behavior patterns began to develop. It was expected that subjects would encounter problems in working through the assigned academic material. These materials included both those used regularly in class and others chosen for group work by the students. It was anticipated that students might have trouble establishing a specific time to study at home because of conflicting schedules of family members. Getting a specific place to study at home was expected to be a difficult problem because most low-income families are unable to provide separate rooms for each of their children. In dealing with this problem, the investigator contacted parents or other family members or advised students as to the best method of handling the problem.

Peer pressures were expected to present problems. Students were counseled and informed of ways to avoid obvious peer-related conflicts. The major emphases in the counseling activities were placed on realism in terms of what is required academically if a person desires certain jobs or positions in society, and realism in regards to what the school actually expects. Emphasis was also placed on accepting responsibility for one's own behavior.

The tutoring-counseling sessions were focused on problems

arising from behavior changes as well as academic problems resulting from home or other environmental conditions. Attempts were made in either case to develop or establish workable solutions for the problems experienced by the students. The goals of these sessions were general and were directed toward problems (conscious or unconscious) encountered by the subjects in their attempts to improve or develop new academic behaviors. (See Appendix III for a complete description of the treatment sessions.)

Group 3, the control group, was asked to plan for a better physical education program at the school. This group was taken on short field trips to look at other schools' physical education facilities. Every effort was made not to engage these students in any academic counseling or tutoring activities of an academic nature. As with Group 1, teachers did not withhold praise when the students in the control group earned it in class. (See Table 2 for a summary of the treatments.)

Instruments

Self-Concept. The Sears (1966) Self-Concept Inventory was used to measure self-concept. It contains 48 items grouped in nine areas: physical ability, attractive appearance, convergent mental ability, social relations with same sex, social virtues, divergent mental ability, work habits, happy qualities, and school subjects. For the purpose of this study, the nine areas were divided into social and academic groupings or categories. The academic categories, considered especially important to this study, are convergent mental ability, divergent

Table 2

Summary of Treatments

	Academic Behavior	Counseling	Reinforcement
Group 1	Assignment of writing; asking questions in class; library reading in specified amounts; paying attention in class; setting study time at home; studying at the same time daily; completing all homework; entering classroom quietly; studying arithmetic and reading at a specific time daily; getting 80 per cent correct on all school work	academic tutoring-counseling	token rewards, social rewards by the teacher only
Group 2		academic tutoring-counseling	social rewards by the investigator and the teacher
Group 3	planning for a better physical education program	no academic tutoring-counseling	no reinforcement except normal social rewards, by the teacher only

mental ability, work habits, and school subjects. The other five categories are related to social self-concept. The instrument can be administered to groups of subjects and its test-retest reliability over nine months has been found by Sears to be .79 (Sears, 1963).

The abbreviated (48-item) form used in the present study was based on items chosen for their reliability and apparent stability in repeated retesting by Sears (1963) for the 100-item form. The Kuder-Richardson 20 reliabilities for the nine areas of the abbreviated form,

as obtained by Sears (1966) with 32 students in the third grade, are shown in Table 3.

Table 3

Areas of the Sears Self-Concept Inventory (Abbreviated Form) and Their Reliability Coefficients (K-R 20) (From Sears, 1966)

Areas	No. of Items	
1. Physical Ability	4	.75
2. Attractive Appearance	4	.76
3. Convergent Mental Ability	8	.89
4. Social Relations with Same Sex	4	.66
5. Social Virtues	4	.68
6. Divergent Mental Ability	8	.83
7. Work Habits	4	.64
8. Happy Qualities	4	.56
9. School Subjects	8	.60

The Cronbach alpha coefficients for the 28 academic self-concept items was found to be .83 for Grade 3 and .82 for Grade 4 children very similar to those in the present study, by Sears, Marx and Nichols (1973).

Reading. One of the specific areas of academic achievement investigated in this study was reading. To examine achievement in reading, the Comprehensive Test of Basic Skills (CTBS) test in reading was administered to all subjects by their teacher in the fall of 1971.

These scores became the pretest data in reading. The same test was administered again in April, 1972 at the conclusion of the treatment. The statistical analysis of reading achievement was performed on the raw scores earned by each of the subjects on the test.

The total reading score was based on two sub-tests: reading vocabulary and reading comprehension. Reading total equalled the sum of the raw scores in these subtests.

Arithmetic. Arithmetic was another major area of interest investigated in this study. The CTBS test in arithmetic was given to subjects by their teacher in the fall of 1971. Those scores became the pretest data. The same test was given again in April, 1972 at the conclusion of the treatment. The statistical analysis of arithmetic achievement was performed on the raw scores earned by each of the subjects on the test.

The arithmetic total score was based on three different subtests: arithmetic computation, arithmetic analysis, and arithmetic application. Arithmetic total was the sum of the raw scores earned in these subjects.

Testers. The three examiners who administered the self-concept tests were former elementary school teachers. They averaged five years of experience in public school teaching. The women were trained during the spring of 1971. They performed testing services for the Stanford project using the same instruments used in this study in both the spring 1971 and fall 1971 testing. They were intimately acquainted with the

test instruments and had had considerable experience in using the instruments as well as working with children.

The examiners were naive about the purpose of the experiment. The examiners gave every indication of feeling comfortable in working with the subjects and had developed good rapport with the subjects because of previous positive interactions.

Teacher Rating. Teachers were asked to rate the students in the study before the treatment began and again at the end of the treatment. They rated the students on intellectual development as low, medium low, medium high, or high. The rating form, shown in Appendix V, included a general statement defining intellectual ability.

CHAPTER III

RESULTS AND DISCUSSION

This chapter contains a presentation and discussion of the results of the study. The initial equality of the three groups is considered, and then the results of correlational analyses and analyses of variance are presented and discussed.

Initial Equality of Groups

To make sure the differences between the groups were not significant before treatment, a one-way analysis of variance was performed on the pretest scores for each variable. Table 4 shows the means and standard deviations for each of the variables for each of the groups. Table 5 shows the analyses of variance between the three treatment groups on the pretest variables. No significant differences were found among the three groups on any of the variables. It may be inferred that the random assignment of the students to the three groups resulted in groups that were initially equivalent in these variables.

Correlational Analysis

Self-Concept

The correlation of total self-concept pretest and total self-concept posttest was .40, indicating only a moderate degree of stability

Table 4

Initial (Pretest) Means and Standard Deviations of the Three Groups on the Various Self-Concept and Achievement Variables

Variables	Token-Counseling			Social-Counseling			Control		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Total Self-Concept	13	3.06	0.37	14	2.89	0.37	14	3.16	0.42
Academic Self-Concept	13	2.96	0.45	14	2.73	0.46	14	2.98	0.59
Reading-Vocabulary	12	11.08	4.31	14	12.20	5.77	13	13.93	5.58
Reading-Comprehension	12	13.39	4.82	14	12.21	5.98	14	14.07	6.92
Reading-Total	12	24.46	7.99	14	24.29	10.85	13	28.00	10.68
Arithmetic-Computation	12	12.62	5.49	14	16.21	9.22	14	14.36	5.44
Arithmetic-Concept	12	9.73	2.90	14	10.33	5.42	14	10.00	4.24
Arithmetic-Application	11	4.46	2.30	14	4.82	3.34	14	4.33	1.44
Arithmetic-Total	11	26.36	8.99	14	32.00	15.89	14	28.75	8.47
Teacher Rating	11	1.36	.51	13	1.39	.65	12	1.42	.67

* F .05 for df of 2, 41 = 3.23

Table 5

The Analysis of Variance of Pretest Scores on Self-Concept, and Achievement Variables

Variables	Source	Sum of Squares	df	Mean Square	F
Total Self-Concept	Between	.56	2	.28	1.83
	Within	5.90	39	.15	
	Total	6.46	41		
Academic Self-Concept	Between	.53	2	.26	1.03
	Within	9.99	39	.26	
	Total	10.52	41		
Reading Vocabulary	Between	56.03	2	28.02	1.00
	Within	1094.25	39	28.06	
	Total	1150.28	41		
Reading Comprehension	Between	24.66	2	12.33	0.34
	Within	1366.36	38	35.96	
	Total	1391.02	40		
Reading Total	Between	121.66	2	60.83	0.61
	Within	3778.09	38	99.42	
	Total	3899.75	40		
Arithmetic Computation	Between	87.45	2	43.72	0.90
	Within	1850.65	38	48.70	
	Total	1938.09	40		
Arithmetic Concept	Between	2.12	2	1.06	0.06
	Within	604.85	32	18.90	
	Total	606.97	34		
Arithmetic Application	Between	1.44	2	0.72	0.12
	Within	187.03	31	6.03	
	Total	188.47	33		
Arithmetic Total	Between	176.17	2	88.09	0.66
	Within	4122.79	31	132.99	
	Total	4298.96	33		
Teacher Rating	Between	0.02	2	.01	0.02
	Within	12.54	33	.38	
	Total	12.56	35		

over all three groups. This correlation was .17 in Group 1, .30 in Group 2, and .60 in Group 3. The correlation of academic self-concept pretest with that on posttest was .35; for Groups 1, 2, and 3, separately, these correlations were .22, .39, and .39, respectively. Again there is some indication of instability over the three groups, but, as can be seen, the range of the correlations for the three groups is much less on the academic self-concept variable than it was on the total self-concept variable.

As shown in Table 6, the self-concept pretest measures correlated about zero with all of the achievement pretest measures. The correlations ranged from -.14 to .13. Since the number of cases was 42 for all three groups combined, an r of .39 is necessary for significance at the .05 level. Hence, none of these rs is significantly different from zero. The correlations of total self-concept pretest measures with posttest achievement measures ranged from -.23 to .17 and hence were also nonsignificant. The correlations of total self-concept posttest with achievement measures pretest ranged from .07 to -.24. The correlations of total self-concept posttest and achievement posttest variables ranged from -.18 to .20. None of these correlation coefficients differed significantly from zero.

For each of the three groups separately, the same correlations are shown in Tables 7 and 8. The correlations between self-concept and academic measures seem to deviate somewhat from the results reported by other researchers. As reported earlier, significant positive correlations of about .45 have been found between self-concept measures and

Table 6

Correlations between Pretest and Posttest Self-Concept and Achievement Variables (N = 42)

	Total Self-Concept Pre	Academic Self-Concept Pre	Total Self-Concept Post	Academic Self-Concept Post
Reading Vocabulary Pre	.13	.11	.07	.00
Reading Comprehension Pre	.08	.06	-.19	-.19
Reading Total Pre	-.12	.09	-.07	-.12
Arithmetic Computation Pre	-.14	-.13	-.24	-.28
Arithmetic Concept Pre	-.06	.03	-.06	-.14
Arithmetic Application Pre	-.14	-.17	-.14	-.25
Arithmetic Total Pre	-.03	-.06	-.20	-.25
Reading Vocabulary Post	-.02	-.05	.13	.15
Reading Comprehension Post	.17	.09	.20	.15
Reading Total Post	.08	.02	.19	.21
Arithmetic Computation Post	-.23	-.15	-.18	-.18
Arithmetic Concept Post	-.12	-.10	-.16	-.24
Arithmetic Application Post	.02	-.10	-.07	-.10
Arithmetic Total Post	-.18	-.16	-.18	-.21

Table 7

The Correlation of Pretest Total Self-Concept with Achievement Variables for Each Group

	Total Self-Concept Pretest Score		
	Group 1 (N=13)	Group 2 (N=15)	Group 3 (N=14)
Reading Vocabulary Post	.29	-.24	.11
Reading Comprehension Post	.21	.26	.27
Reading Total Post	.32	.01	.20
Arithmetic Computation Post	-.20	-.34	.10
Arithmetic Concept Post	.08	-.22	-.05
Arithmetic Application Post	.40	-.12	.09
Arithmetic Total Post	-.04	-.30	.05
Teacher Rating Post	-.07	.39	.16

academic achievement as measured by various achievement tests (Anastasiow, 1967; Jersild, 1952; Reader, 1955; Stevens, 1966; Brookover, 1964; and Bledsoe, 1964). The correlations found in this study between self-concept measures and academic achievement measures are lower than those obtained in most previous studies.

The rank-order correlation was rho = .28, as compared with the Pearson r of .21 shown in Table 6. This correlation is not significant, but is higher than the correlation (r = .15) found between total self-

Table 8

The Correlation of Posttest Total Self-Concept with Pretest Achievement Variables for Each Group

	Total Self-Concept Posttest Score		
	Group 1 (N=13)	Group 2 (N=15)	Group 3 (N=14)
Reading Vocabulary Pre	.52	-.11	.08
Reading Comprehension Pre	.26	-.04	-.41
Reading Total Pre	.43	-.07	-.27
Arithmetic Computation Pre	.30	-.62	-.01
Arithmetic Concept Pre	.54	-.34	.04
Arithmetic Application Pre	.52	-.47	-.20
Arithmetic Total Pre	.52	-.59	-.03
Teacher Rating Pre	.12	-.42	.50

concept and verbal achievement by Sears, et al. (personal communication), where 160 students from the same school where this study was carried out were measured. The correlations found in this study may be generally lower than those found by others because of the restricted range of scores of subjects who were all below the class mean on both self-concept and achievement measures. The range of class means pretest on total self-concept was 3.2 to 3.6, while the range of scores for the students in our sample was 2.1 to 3.5. The range of scores of

pretest academic self-concept for our subjects was 1.8 to 3.1, and thus all fell below the class mean range of 3.1 to 3.7. The range for the reading total scores of our students was 2.3 to 3.7, and all of these scores also fell below the class mean range of 2.3 to 4.3. The range for the arithmetic total scores for our students was 2.0 to 4.5, and all of these scores fell below the class mean range of 3.0 to 4.6.

Reading

As shown in Table 9, the intercorrelations among the reading pretest subtests ranged from .54 to .89; all of these rs were significantly greater than zero. The correlations of the reading posttest subtests were slightly lower, with a range of .49 to .86, but the correlations remained significant. The pretest to posttest correlations of the reading subtests ranged from .35 to .58 with half of the correlations significant. In general, these coefficients are about what should have been expected if the tests had adequate reliability.

Arithmetic

The intercorrelations among the arithmetic pretest subtests were significant, except for computation and application subtests ($r = .19$), with a range from .54 to .90. The intercorrelations among the arithmetic posttest subtests were higher, and all of the correlations were significant, ranging from .43 to .93. (See Table 10.)

As shown in Table 11, the correlations between arithmetic pretests and reading pretests ranged from .13 to .60, with a median of .50. The same correlations for the posttest arithmetic and reading

Table 9

Intercorrelations between Reading Scores
(N = 42)

	Reading Comprehension Pretest	Reading Total Pretest	Reading Vocabulary Posttest	Reading Comprehension Posttest	Reading Total Posttest
Reading Vocabulary Pretest	.54	.86[a]	.58	.25	.49
Reading Comprehension Pretest		.89[a]	.38	.36	.43
Reading Total Pretest			.54	.35	.52
Reading Vocabulary Posttest				.49	.87[a]
Reading Comprehension Posttest					.86[a]

[a]This r is based on a part-whole relationship.

Table 10

Intercorrelations between Arithmetic Scores
(N = 42)

	Arithmetic Concept Pretest	Arithmetic Application Pretest	Arithmetic Total Pretest	Arithmetic Computation Posttest	Arithmetic Concept Posttest	Arithmetic Application Posttest	Arithmetic Total Posttest
Arithmetic Computation Pretest	.63	.19	.90[a]	.81	.63	.55	.85
Arithmetic Concept Pretest		.57	.89[a]	.58	.51	.45	.63
Arithmetic Application Pretest			.54[a]	.38	.28	.24	.38
Arithmetic Total Pretest				.80	.65	.60	.83
Arithmetic Computation Posttest					.61	.43	.93[a]
Arithmetic Concept Posttest						.49	.82[a]
Arithmetic Application Posttest							.64[a]

[a]This r is based on a part-whole relationship.

Table 11

Intercorrelations between Pretest and Posttest Arithmetic and Reading Scores
(N = 42)

	Reading Vocabulary Pretest	Reading Comprehension Pretest	Reading Total Pretest
Arithmetic Computation Pretest	.40	.13	.29
Arithmetic Concept Pretest	.59	.50	.60
Arithmetic Application Pretest	.54	.44	.54
Arithmetic Total Pretest	.54	.39	.51
	Reading Vocabulary Posttest	**Reading Comprehension Posttest**	**Reading Total Posttest**
Arithmetic Computation Posttest	.33	.17	.30
Arithmetic Concept Posttest	.31	.35	.39
Arithmetic Application Posttest	.23	.37	.35
Arithmetic Total Posttest	.37	.32	.40

scores ranged from .17 to .40, with a median of .32. Clearly, the later (posttest) correlations are lower, indicating that the treatment caused students to become more differentiated in their academic skills. There were significant correlations obtained between reading subtests and arithmetic subtests at pretest, but at posttest, that significance had disappeared.

The trend reported above may have resulted from the increased ability among subjects in Groups 1 and 2. In the tutoring-counseling sessions, emphasis was placed on realism (appraising one's own performance in the light of how others appraise it) and understanding (comprehending what is expected by others) before proceeding to act. It is possible that, by improving their reading, students in Groups 1 and 2 became more reluctant to guess at questions in the concept and application areas of the posttest arithmetic subtests. Their achievement tended to be lower in the arithmetic posttest, as Table 17 shows. Group 3 was not thus influenced. It is perhaps for this reason that the students were less consistent in their standing in arithmetic and reading at the time of the posttest than at the time of the pretest. This change also may have resulted in a lowering of the correlation between reading and arithmetic. (See Appendices XI through XVI for within-group correlations.)

Teacher Rating

The correlations of teacher rating with the total and academic self-concept measures, respectively, were essentially zero at pretest (rs = -.01 and -.01). The correlations of pretest teacher ratings with

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Table 12

The Correlation between Pretest and Posttest Teacher Rating and Pretest Achievement and Self-Concept Scores

	Teacher Rating Pretest	Teacher Rating Posttest
Total Self-Concept Pretest	-.01	.10
Academic Self-Concept Pretest	-.01	.04
Reading Vocabulary Pretest	.23	.02
Reading Comprehension Pretest	.02	-.17
Reading Total Pretest	.15	-.10
Arithmetic Computation Pretest	.29	-.08
Arithmetic Concept Pretest	.01	-.14
Arithmetic Application Pretest	.10	.11
Arithmetic Total Pretest	.23	-.03

Table 13

The Correlation between Posttest Teacher Rating and Posttest Achievement and Self-Concept Scores

	Teacher Rating Posttest
Total Self-Concept Posttest	.15
Academic Self-Concept Posttest	.20
Reading Vocabulary Posttest	.29
Reading Comprehension Posttest	.28
Reading Total Posttest	.33
Arithmetic Computation Posttest	-.00
Arithmetic Concept Posttest	.13
Arithmetic Application Posttest	.13
Arithmetic Total Posttest	.06

the pretest achievement subtest and total scores in reading and arithmetic ranged from .01 to .29, with a median of .12. The correlations at posttest between teacher rating and the self-concept and achievement variables ranged from .00 to .29, with a median of .18. Thus there was a slight increase in the general magnitude of the correlations for teacher ratings with other variables, even though none of the correlations was significant. The increase in median r from .12 to .18, from the pretest to the posttest, suggests that the teachers tended to "know" their students slightly better at the time of the posttest in that their ratings correlated a little more highly with measures of self-concept and achievement.

Differences between Treatment Groups

The analyses used to test the major hypotheses of the investigation are reported in this section. Three hypotheses were posed:

1. Social or token reinforcement of behaviors identified as important to academic success increases achievement.
2. As academic achievement improves, academic self-concept becomes more positive.
3. Social rewards are more effective than economic or token rewards in altering behaviors important to academic achievement.

To test the hypotheses posed, two-way analyses of variance, using the linear hypotheses model, were used. This model provides tests of the differences in posttest means adjusted for variance in the

pretest means, in the same way that the analysis of covariance would provide such adjustments. The assumptions which must be met in order to use the model are homogeneity of variance and parallel regression lines, i.e., regression lines without significant differences in slope, or homogeneity of regression lines. The data met both of the assumptions. (See Appendix IX for a complete list of regression data.)

Reading

As Table 14 shows, the results of the analysis indicate significant main effects of the treatment on the reading variables. The mean for Group 2 (social reward) was significantly higher than those of the other two groups on each of the adjusted posttest reading scores. Group 1 was not significantly different from Group 3 in any of the reading comparisons. Groups 1 and 2 did not differ significantly on the reading vocabulary variable. Group 2 had a significantly higher mean than that of Group 1 and Group 3 for reading comprehension and reading total.

The results of the analysis of the reading measures partially support the hypotheses set forth in this study. The analysis of variance shows that Group 2 (social reward) had improved significantly in the various reading measures over Group 1 (token reward) and Group 3 (control) at the time of the posttest. The subjects in the social reward treatment group apparently benefitted more from the tutoring and counseling than did the token reward group. Social rewards were more influential than were token rewards.

Table 14

Analysis of Variance
Linear Hypothesis Model

Source	SS	Df	Mean Square	F
Reading Vocabulary				
Mean	181.19	1	181.19	7.50
Treatment	172.69	2	86.35	3.58*
Sex	0.01	1	0.01	0.00
TxS	54.35	2	27.17	1.13
Group 1-2	39.01	1	39.01	1.62
Group 1-3	0.26	1	0.26	0.01
Group 2-3	128.78	1	128.78	5.33*
Covariate	555.36	1	555.36	23.00
Error	772.63	32		
Reading Comprehension				
Mean	441.25	1	441.25	15.01
Treatment	211.87	2	105.94	3.60*
Sex	27.73	1	27.73	0.94
TxS	77.33	2	38.67	1.32
Group 1-2	200.46	1	200.46	6.82*
Group 1-3	113.06	1	113.06	3.85
Group 2-3	194.66	1	194.66	6.62*
Covariate	221.68	1	221.68	7.54
Error	970.14	33	29.40	
Reading Total				
Mean	764.33	1	764.33	10.33
Treatment	677.90	2	338.95	4.67*
Sex	28.65	1	28.65	0.39
TxS	174.30	2	87.15	1.17
Group 1-2	444.25	1	444.25	5.99*
Group 1-3	108.08	1	108.08	1.46
Group 2-3	672.56	1	672.56	9.07*
Covariate	1374.64	1	1374.64	18.53
Error	2373.75	32	74.18	

*Significant beyond .05.

Arithmetic

As Table 15 shows, the results of the analysis of the arithmetic measures provide no support for the hypotheses. There were no significant differences found between groups using any of the analyses. The direction of the group differences were, however, generally the same as those found in the reading data. As Table 17 shows, Group 2 consistently had the highest adjusted posttest mean score using the analysis of variance, followed by Group 1 and Group 3.

Self-Concept and Teacher Rating

As Table 16 shows, there were no significant differences found between groups for the self-concept and teacher rating variables. The treatment and control groups seemed to be about equal on the self-concept and teacher rating measures.

The results reported above for Group 2 support Hypotheses 1 and 3. Hypothesis 2 was not completely supported because there was no significant change in total or academic self-concept.

Differences between Pretests and Posttests

As Table 17 shows, the mean differences between pretest and posttest means on the reading subtests are interesting. Group 2 had the largest mean change on the reading subtests; all these differences were at the .05 level. The mean change was not significant for Groups 1 and 3. For Group 2, the mean change in reading vocabulary was +5.09; in reading comprehension, +3.65; and in reading total, +8.85. For Group 3, the change in means from pretest to posttest for reading

Table 15

Analysis of Variance
Linear Hypothesis Model

Source	SS	df	Mean Square	F
Arithmetic Computation				
Mean	491.54	1	491.54	15.50
Treatment	21.93	2	10.97	0.35
Sex	5.35	1	5.35	0.17
TxS	26.04	2	13.02	0.41
Covariate	2025.40	1	2025.40	63.88
Error	1046.38	33	31.71	
Arithmetic Concept				
Mean	178.02	1	178.02	13.34
Treatment	63.65	2	31.82	2.38
Sex	45.53	1	45.53	3.41
TxS	56.88	2	28.29	2.11
Covariate	225.88	1	225.88	16.93
Error	373.69	28	13.35	
Arithmetic Application				
Mean	155.87	1	155.87	17.34
Treatment	12.09	2	6.04	0.67
Sex	11.90	1	11.90	1.32
TxS	5.19	2	2.59	0.29
Covariate	24.01	1	24.01	2.67
Error	233.72	26	8.99	
Arithmetic Total				
Mean	551.07	1	551.07	9.44
Treatment	193.55	2	96.77	1.66
Sex	107.00	1	107.00	1.83
TxS	336.04	2	168.02	2.88
Covariate	4684.04	1	4684.04	80.21
Error	1518.38	26	58.40	

Table 16

Analysis of Variance
Linear Hypothesis Model

Source	SS	df	Mean Square	F
Total Self-Concept				
Mean	1.01	1	1.01	3.19
Treatment	0.09	2	0.05	0.15
Sex	0.33	1	0.33	1.04
TxS	0.26	2	0.13	0.41
Covariate	2.04	1	2.04	6.42
Error	10.79	34	0.32	
Academic Self-Concept				
Mean	3.16	1	3.16	7.90
Treatment	0.05	2	0.03	0.06
Sex	0.43	1	0.43	1.08
TxS	0.08	2	0.04	0.09
Covariate	2.01	1	2.01	5.01
Error	13.60	34	0.40	
Teacher Rating				
Mean	3.36	1	3.36	4.22
Treatment	3.25	2	1.62	2.04
Sex	0.87	1	0.87	1.10
TxS	2.90	2	1.45	1.83
Covariate	5.53	1	5.53	6.95
Error	23.06	29	0.80	

Table 17

Group Mean Difference Pretest to Posttest

Source	Group 1 (token) Tutoring-Counseling			Group 2 (social) Tutoring-Counseling			Group 3 (control Tutoring-Counseling		
	Pre	Post	Difference	Pre	Post	Difference	Pre	Post	Difference
Total Self-Concept	3.06	3.24	.18	2.89	3.07	.18	3.16	3.16	.00
Academic Self-Concept	2.96	3.19	.23	2.73	3.02	.29	2.89	3.12	.14
Reading Vocabulary	11.08	14.50	3.42	12.20	17.29	5.09*	13.93	14.15	.22
Reading Comprehension	13.39	11.33	-2.06	12.21	15.86	3.65*	14.07	13.64	-.43
Reading Total	24.46	25.83	1.37	24.29	33.14	8.85*	28.00	27.69	-.31
Arithmetic Computation	12.62	21.83	9.21	16.21	26.57	10.36	14.36	22.29	7.93
Arithmetic Concept	9.73	9.92	.16	10.33	13.93	3.60	10.00	13.00	3.00
Arithmetic Application	4.46	6.91	2.45	4.82	7.21	3.39	4.33	5.43	1.10
Arithmetic Total	26.36	38.82	12.26	32.00	47.71	15.71	28.75	40.71	11.96
Teacher Rating	1.36	1.64	-.28	1.39	2.15	.76	1.42	1.58	.16

*$p < .05$.

vocabulary was +.22; for reading comprehension, -.43; and for reading total, -.60. The amount of reading skill improvement of Group 2, the social reward group, over Group 3, the control group, is clear.

Arithmetic

As Table 17 shows, the group mean changes on the arithmetic subtests, pretest to posttest, were much less for the various groups than were those on the reading subtests. Group 2 had the largest group mean difference from pretest to posttest, followed by Groups 1 and 3, respectively. Although all of the groups made substantial gains, Group 2, the social reward group, consistently had the largest gain on each of the arithmetic subtests. Group 1 had a higher mean gain than did Group 3 on all of the arithmetic subtests except arithmetic concepts.

Self-Concept

As Table 17 shows, there was only a slight increase from pretest to posttest in Group means in the self-concept areas. Groups 1 and 2 had the greatest mean change for total self-concept, +.18. Group 3 did not have any change in means from pretest to posttest on the total self-concept measures; its mean at both testings was 3.16. The change in academic self-concept was largest in mean value for Group 2 (+.29), followed by Group 1 (+.23) and Group 3 (+.14). There is little support, based upon mean differences from pretest to posttest, for the hypothesis that token or social rewards combined with counseling influenced self-concept in these students.

Teacher Rating

As Table 17 shows, the mean change on teacher rating from pretest to posttest did differ somewhat between groups. Group 2 tended to show the largest change, followed by Groups 1 and 3, in that order.

Summary of Results

Reading

The results of the analysis on the reading variables support, with limitations, the hypotheses posed. It is clear that Group 2 benefitted more than either of the other two groups from the experimental treatment. It was generally felt that social reward conditions combined with tutoring and counseling would be more effective in improving academic achievement and self-concept than either the token reward condition or no reward condition. This general prediction was supported. Group 2 did achieve significantly better than Groups 1 and 3. Also, it was apparent, looking at the analysis, that Group 1 obtained higher, but not significantly higher, achievement scores than did Group 3.

The results reported above support the hypotheses that social rewards are more effective than economic or token rewards in altering behaviors important to academic success. Presumably, the social or token reinforcement of behaviors identified as important to academic success increased the frequency of those behaviors in low self-concept children, but no direct evidence on these behaviors was obtained in this study. Presumably as a result of changes in such behaviors,

academic achievement as measured by tests improved.

Arithmetic

The results of the analysis of the arithmetic measures indicate a trend which, although nonsignificant statistically, is supportive of the hypotheses and predictions. The trends in the data were, however, generally the same as were found in the reading data. Group 2 consistently had the highest posttest mean as well as the largest mean change from pretest to posttest; it was followed by Groups 1 and 3, in that order.

A reward system in the arithmetic lessions was instituted in mid-February, 1972, by the school where this study was carried out. This reward system was unanticipated by the present author, and it may have significantly affected the outcomes of the present study. As part of a reinforcement program at the school, children in each class were rewarded for their achievement in arithmetic weekly. The result of this reward system was that all students (i.e., students in all three groups) received rewards for achievement in arithmetic. The result was that subjects in the control group of this study received rewards for arithmetic achievement as a part of the school program. It is perhaps remarkable that Group 2 maintained an achievement level higher than Group 1 and Group 3 in spite of this uniform motivational program for all three groups that inadvertently became part of the program in the school where this study was conducted.

Self-Concept

One major objective of this study was to determine the effect

of academic achievement on the development of self-concept. Conceptually, it was felt that the extent to which academic achievement will affect self-concept depends upon the perception of one's own abilities and how that perception influences the behavior. The perception of one's abilities and the behavior produced becomes especially important when successful as well as unsuccessful behavior is likely to become known to people who are important in one's life (Lewin, 1948).

The results of the data analysis did not support the hypothesis that, as academic achievement improves, academic self-concept becomes more positive. There was only a slight improvement in both total and academic self-concept from pretest to posttest, and it did not exceed the change which could be expected by chance.

The counseling of the subjects in this study may be responsible for the small improvement in self-concept from pretest to posttest. In the counseling sessions, realism was emphasized. Subjects were asked to take a realistic look at themselves. They were asked to look at or think of themselves in the same way as the significant others in their lives (e.g., the teachers, the principal and the vice principal, the experimenter and their parents) look at and think of them. The entire first two one-hour sessions were spent basically in exploring the various meanings of respect and how one could get respect from others.

The conversation in the counseling sessions returned to the above theme on numerous occasions during the course of the treatment. As a result, it is suspected that the self-concept of the subjects, if it had been measured during the first quarter of the program, would have

been lower than the recorded pretest self-concept scores.

The study continued for 12 weeks. In that time it was difficult to give students the kind of frequent feedback they should have received in regard to their actual academic performance. They were urged during the counseling sessions to base their perceptions of how they were doing in comparison to others upon recognizable and respected criteria set up by those significant others. For example, one sixth-grade student, when asked what he wanted to be when he finished school, replied, "a marine biologist." He had no idea of what is required, academically, to become a marine biologist. This student performed at the second-grade level on the reading pretest. The above represents the kind of discrepancy between actual requirements for academic success and the perceptions of the requirements for academic success initially held by most of the students in the experimental groups. Thus, it is not surprising, after the fact, that students in the treatment groups did not make any substantial gains in self-concept during the 12-week treatment period.

Teacher Rating

None of the analyses performed on the teacher ratings indicated group differences. It now seems apparent that the rating form was not suited to measure teacher-perceived changes in the students over a short period of time. The form is potentially useful, however, in focusing the teacher's attention on the growth of the students.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Statement of the Problem

The education of underachieving children from low-income, ghetto, and minority groups has presented an overwhelming challenge for researchers and educators. These students display a low level of performance in school and regard themselves as worse than most students when asked to evaluate themselves on their school performance. It became apparent from a systems-based approach to the determination of the behaviors expected by the school that these students were unaware of the real demands of the school. Their academic abilities were undeveloped because they were unaware of the need to develop those abilities.

The behavior of students is a good indicator of what is perceived as important, from the student's point of view, to success in school. Most of the students in poor or minority-dominated schools give a higher priority to social acceptance by peers and by others close to the students than to educational achievement. If the education of the poor and the minority students is to improve, it will be necessary for education to develop ways of enhancing and, in some cases, instilling in these students behaviors relevant to academic achievement.

Educators concerned with growth and development in children

have become aware of the possible impact of self-concept on academic achievement. The problem is that most of the studies have been limited limited mainly to correlational relationships between self-concept and achievement. The need, it seems, is to isolate the behaviors which are essential to academic achievement and then to develop methods which, when applied to academic behaviors, strengthen them in children.

The present study attempts to attack the problem by (1) identifying behaviors which appear to be important to academic achievement, (2) selecting methods to reward the behaviors when they are observed, and (3) measuring the achievement and self-concept outcomes.

Hypotheses and Rationale

Three hypotheses were set forth: (1) Social or token reinforcement of behaviors identified as important to academic success increases achievement. (2) As academic achievement improves, academic self-concept becomes more positive. (3) Social rewards are more effective than economic or token rewards in improving academic achievement.

The rationale underlying this study is as follows: (a) If a desired behavior has a low frequency of occurrence, the application of reinforcers will increase the likelihood that the behavior will be repeated by the subjects. This is true for reinforcers, whether they are social or token reinforcers. (b) If the above statement is borne out, and the frequency of the academic behaviors does increase, academic achievement should improve. (c) The correlation between self-concept and academic achievement has already been established. The attempt

here is to begin to isolate the nature of any causal relationship, that is, to determine whether improved academic achievement changes self-concept or whether, regardless of improved academic achievement, academic self-concept remains unchanged. (d) Social rewards will be more effective than token rewards among the subjects involved in this study because of the high value placed on social acceptance and approval by these students.

Method

A sample of 42 black students with scores below the average of their class on achievement and self-concept measures were selected for this study from three grades in one school. The students were randomly assigned to one of three treatment groups. In Group 1, the subjects received intensive tutoring and counseling combined with token reinforcement. In Group 2, the subjects received intensive tutoring and counseling combined with social reinforcement. Group 3 received no counseling or reinforcement.

The effects of the treatment were studied in a 3x2, group by test occasion, design. The subjects were pretested on academic and self-concept measures, received their respective treatment, and were posttested on the same measures. Pretest and posttest instruments used were (1) the Comprehensive Test of Basic Skills (published by McGraw-Hill, Reading and Arithmetic 1969), (2) the Sears Self-Concept Inventory (Sears, 1963), and (3) a teacher rating of each student.

Results and Discussion

The analysis of variance of the reading data shows that Group 2 (social reward) improved significantly as compared to Group 1 (token reward) and Group 3 (control) at posttest. The findings for Group 2 on the reading variables support two of the major hypotheses (1 and 3). Hypothesis 2 regarding the self-concept of the subjects was rejected.

The results of the analysis indicate that teachers in schools like the one involved in this study should be especially knowledgeable about the social rewards valued by their students. The interplay between the attitudes of the students toward various rewards and the demonstrated need for academic behavior development should be an essential consideration in the design of curriculum components for the classroom. The lower correlations between reading and arithmetic on the posttest as compared to the pretest suggest that the treatments made the children more dissimilar within themselves in these kinds of achievement. The measures of achievement in reading and arithmetic were significantly correlated on the pretest but not on the posttest.

No significant main effects were found for the rating by the teachers. The ratings of students were more favorable at posttest, but group differences were not significant.

Implications for Educational Practice

Educational research is usually carried out with the hope of discovering new ways of influencing or improving learning. An examination of the results suggests some recommendations for educational

practice.

It is important in an effort to improve the motivation and persistence of students similar to the ones in this study to develop reinforcement systems which are relevant to the students involved.

It is essential for teachers working in schools like that of the present study to recognize the need in the students for considerable social reinforcement and to provide it frequently. To achieve is of special importance in our society. Achievement is a major goal of the school, and it is a prerequisite for subsequent academic and occupational success. It is highly likely that appropriate social reinforcement in their early years of student behavior conducive to achievement will enhance their desire to achieve in their later years.

Students from low-income black families may lack the perspective of the real educational world necessary for them to succeed in school. The development of appropriate treatments in schools attended mainly by poor or black children should entail providing seriously needed counseling and advisory services for elementary grade students.

Implications for Research

Another contribution of educational research is the groundwork laid for improved future research. It is hoped that the implications of the present research will be tested further with appropriate expansion, adaptation, and refinement. The following areas of study need further investigation:

1. Investigation of whether the low correlation between scores

on the self-concept measures and achievement measures, obtained in this study, resulted from the low mean scores of the students, and the restriction of range, on these measures.

2. Use of a larger sample of subjects in replicating this study to explore possible aptitude-treatment interactions.
3. Determination of whether the effects noted in this study could be achieved by training other persons, with standardized teacher-training products, such as manuals and videotapes, to provide the tutoring and counseling.

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APPENDIX I

SELF-CONCEPT SCALE

STANFORD CENTER FOR RESEARCH AND DEVELOPMENT IN TEACHING--
SCHOOL OF EDUCATION

Name_____ Boy___Girl___ Grade _____

Teacher _____

Some boys and girls have thought about the things they do and decided that the items on these pages were helpful in thinking about themselves. This is a chance for you to look at yourself and decide what your strong points are and what your weak points are. This is not a test; we expect everyone to have different answers--so be sure your answers show how you think about yourself. Your answers are private and will be kept in confidence.

Read each item and then answer the questions: Compared with other boys and girls my age, how do I rate now?

Find the line under whatever heading indicates your answer. (The words at the top show what the lines in each column stand for.) Mark an X on that line. Now go right ahead. Work as fast as you like.

	Excellent	Very good	Better than most	OK	Not so good
1. Being good at sports	____	____	____	____	____
2. Learning things rapidly	____	____	____	____	____
3. Making friends easily with my own sex	____	____	____	____	____
4. Having new, original ideas	____	____	____	____	____
5. Getting my school work done on time and not getting behind	____	____	____	____	____
6. Being able to read well	____	____	____	____	____
7. Being a good size and build for my age	____	____	____	____	____
8. Remembering what I've learned	____	____	____	____	____
9. Being willing for others to have their way sometimes	____	____	____	____	____
10. Solving problems in ways others haven't tried	____	____	____	____	____
11. Being confident, not shy or timid	____	____	____	____	____
12. Knowing how to do math	____	____	____	____	____
13. Being good at things that require physical skill	____	____	____	____	____
14. Being a good student	____	____	____	____	____

	Excellent	Very good	Better than most	OK	Not so good
15. Being a leader--one to get things started with my own sex	____	____	____	____	____
16. Thinking up answers to problems--answers no one else has thought of	____	____	____	____	____
17. Being able to concentrate	____	____	____	____	____
18. Being interested in science; learning about things that scientists do	____	____	____	____	____
19. Being attractive, good looking	____	____	____	____	____
20. Having brains for college	____	____	____	____	____
21. Making other people feel at ease	____	____	____	____	____
22. Learning about new things even when other people aren't interested--studying about things on my own	____	____	____	____	____
23. Getting a lot of fun out of life	____	____	____	____	____
24. Writing creative stories and poems	____	____	____	____	____
25. Being a good athlete	____	____	____	____	____
26. Being able to apply what I've learned	____	____	____	____	____
27. Having plenty of friends of my own sex	____	____	____	____	____

	Excellent	Very good	Better than most	OK	Not so good
28. Seeing new ways of thinking about things and putting ideas together	____	____	____	____	____
29. Spending most of my time on my work, not goofing off	____	____	____	____	____
30. Having good hand-writing even when I'm hurried	____	____	____	____	____
31. Being not too skinny, not too fat	____	____	____	____	____
32. Having brains	____	____	____	____	____
33. Being sensitive to what others are feeling	____	____	____	____	____
34. Being able to see things in my mind easily when I want to	____	____	____	____	____
35. Being able to change things when they don't suit me	____	____	____	____	____
36. Being able to spell correctly	____	____	____	____	____
37. Enjoying games and sports	____	____	____	____	____
38. Being smart	____	____	____	____	____
39. Being active in social affairs with my own sex	____	____	____	____	____
40. Being interested in new things; excited about all there is to learn	____	____	____	____	____

	Excellent	Very good	Better than most	OK	Not so good
41. Well organized; having materials ready when needed	____	____	____	____	____
42. Learning about people around the world and being interested in them	____	____	____	____	____
43. Having nice features (eyes, nose, etc.)	____	____	____	____	____
44. Knowing what to do for the right answer to a problem	____	____	____	____	____
45. Being easy to get along with	____	____	____	____	____
46. Letting my imagination go when I want to	____	____	____	____	____
47. Enjoying myself in school	____	____	____	____	____
48. Doing well in art work, painting or drawing	____	____	____	____	____

APPENDIX I-A

ITEMS ON THE SEARS' SELF-CONCEPT INVENTORY RELEVANT TO ACADEMIC ABILITY

1. Learning things rapidly
2. Having new, original ideas
3. Getting my school work done on time and not getting behind
4. Being able to read well
5. Remembering what I've learned
6. Solving problems in ways others haven't tried
7. Knowing how to do math
8. Being a good student
9. Thinking up answers to problems--answers no one else has thought of
10. Being able to concentrate
11. Being interested in science; learning about things that scientists do
12. Having brains for college
13. Learning about new things even when other people aren't interested--studying about things on my own
14. Writing creative stories and poems
15. Being able to apply what I've learned
16. Seeing new ways of thinking about things and putting ideas together.
17. Having good handwriting even when I'm hurried
18. Spending most of my time on my work, not goofing off
19. Having brains

20. Being able to see things in my mind easily when I want to

21. Being able to spell correctly

22. Being smart

23. Being interested in new things; excited about all there is to learn

24. Well organized; having materials ready when they're needed

25. Learning about people around the world and being interested in them

26. Knowing what to do to get the right answer to a problem

27. Letting my imagination go when I want to

28. Doing well in art work, painting, or drawing

APPENDIX I-B

SELF-CONCEPT SCORE SHEET

Child's Name _____ Teacher_____ School_____

Scorer_____ Date_____

STANFORD CENTER FOR RESEARCH AND DEVELOPMENT IN TEACHING

The Self-Concept Score Sheet

Items	Physical ability	Attractive appearance	Convergent mental	Social relations same sex	Social virtues	Divergent mental	Work habits	Happy qualities	School subjects	Total
1-6	1)		2)	3)		4)	5)		6)	
7-12		7)	8)		9)	10)		11)	12)	
13-18	13)		14)	15)		16)	17)		18)	
19-24		19)	20)		21)	22)		23)	24)	
25-30	25)		26)	27)		28)	29)		30)	
31-36		31)	32)		33)	34)		35)	36)	
37-42	37)		38)	39)		40)	41)		42)	
43-48		43)	44)		45)	46)		47)	48)	
Total										
No. Items	4	4	8	4	4	8	4	4	8	48
Average										

Excellent = 5 Better than most = 3 Not so good = 1

Very good = 4 OK = 2

APPENDIX II

BEHAVIORS TO BE MODIFIED

1. Write down every assignment in class each day.
2. Ask twenty questions in class each week which are related to class work.
3. Get 80 percent of written work correct.
4. Go to the library and read for 30 minutes each school day.
5. Awareness of classroom activity: One classroom event must be submitted to the experimenter in writing for each school day (in-class academic work or activities).
6. Set a time to study at home. One hour each night or evening.
7. Complete all home work assignments.
8. Study at the same time each day.
9. The one-hour study time is to be divided equally between reading and arithmetic; 30 minutes for each subject
10. Enter the classroom quietly each time.

SCORE CARD

Below are the things you will have to do to get a reward.

Make a mark for each question you ask in the box under the day on which you ask it.

A. Ask twenty questions in class each week.

Mon.	Tues.	Wed.	Thurs.	Fri.

For B through F make a mark for each time you do the following things in the box under the day on which it is done.

B. Get 80 percent of written work correct.

Mon.	Tues.	Wed.	Thurs.	Fri.

C. Complete all homework assignments.

Mon.	Tues.	Wed.	Thurs.	Fri.

D. Study at the same time each day.

Mon.	Tues.	Wed.	Thurs.	Fri.

E. Enter the room quietly each time.

Mon.	Tues.	Wed.	Thurs.	Fri.

F. Go to the library and read for 30 minutes each day.

Mon.	Tues.	Wed.	Thurs.	Fri.

Each time you study reading for 30 minutes write a 1 in the box; when you study arithmetic for 30 minutes write a 2 in the box.

G. Study at home for one hour each night.

Mon.	Tues.	Wed.	Thurs.	Fri.

IMMEDIATELY
After Completing the Task Mark the Box on the Left
FOR YOUR REWARD

CLASSROOM ACTIVITY
(ACADEMIC WORK OR ACTIVITIES)

		CLASS	DATE

APPENDIX III

PROPOSED ACTIVITIES OF THE TUTORING-COUNSELING SESSIONS

DAY #1. The first hour will be used to discuss with subjects goals and objectives of the program. The behaviors which are to be modified will be explained and discussed. Record keeping techniques, score cards, and reward systems will be explained.

DAY #2. A brief restatement of the goals and objectives. Additional discussion of behaviors to be modified, record keeping and rewards. Check again for commitment to the program, and problems encountered. Tutoring will be provided.

DAY #3. Discussion of problems encountered
1. Tutoring
2. Counseling

DAY #4. Discussion of progress made
1. New behaviors developed
2. Examine the reality of goals and objectives
3. Evaluation of record keeping and reward system
4. Discuss broader behavioral modification problems and possibilities (teachers, parents, peers, and others)

DAY #5. Discussion of problems encountered
1. Counseling
2. Role playing
3. Tutoring

DAY #6. Problem solving
1. Discussion of possible reasons for changes in the behavior of others (peers, teachers, and parents)
2. Counseling
3. Tutoring

DAY #7. Problem solving
1. Counseling
2. Tutoring
3. Role playing

DAY #8. Discussion of progress
1. Overcoming problem behavior
2. Re-establishing the desirability of goals and objectives

DAY #9. Problem solving
1. Tutoring
2. Counseling

DAY #10. Discussion of problems encountered
1. Role playing if necessary
2. Counseling
3. Tutoring

DAY #11. Problem solving
1. Tutoring
2. Counseling

DAY #12. Discussion of progress
1. Success in overcoming problem behavior
2. Re-establishing the desirability of goals and objectives

DAY #13. Discussion of problems encountered
1. Role playing if necessary
2. Counseling
3. Tutoring

DAY #14. Discussion of progress made
1. Success of new behaviors
2. Examining the reality of goals and objectives
3. Evaluation of record keeping and reward system
4. Discussion of possible reasons for changes in the behavior of others (peers, teachers, and parents)

DAY #15. Problem solving
1. Counseling
2. Tutoring

DAY #16. Discussion of progress
1. Overcoming problem behavior
2. Re-establishing the desirability of goals and objectives

POST-TESTING AT THE END OF THIS SESSION

DAY #17. Problem solving
1. Tutoring
2. Counseling

DAY #18. Discussion of problems encountered
1. Role playing if necessary
2. Counseling
3. Tutoring

DAY #19. Problem solving
1. Tutoring
2. Counseling

DAY #20. Discussion of progress made
1. Development of desired behaviors
2. Discussion of reality of goals and objectives
3. Evaluation of record keeping and reward system

DAY #21. Problem solving
1. Tutoring
2. Counseling

DAY #22. Discussion of problems encountered
1. Role playing if necessary
2. Tutoring
3. Counseling

DAY #23. Discussion of progress
1. Subjects express feelings about behavior change, if any
2. Examine feelings about goal setting

DAY #24. Summary
1. Discussion of all problems encountered
2. Recommendations from subjects as to the best way to solve problems in the future
3. Discussion of progress made

END OF TREATMENT

FINAL POST-TESTING AT THE END OF THIS SESSION

APPENDIX IV

SYSTEMS-ANALYSIS OF SELF CONCEPT
ACADEMIC BEHAVIOR

LOCATION OR ENVIRONMENT									BEHAVIORS
					X	X	X	X	*COMPLETING HOME WORK*
							X		WRITING DOWN ASSIGNMENTS IN CLASS
					X		X	X	GOING TO THE LIBRARY
X					X	X	X	X	FINDING BOOKS NEEDED
					X				READING QUIETLY IN THE LIBRARY
					X		X		READING MATERIALS ASSIGNED
					X		X		OUTLINING MATERIALS
					X		X		WRITING ANSWERS TO QUESTIONS ASKED
	X	X	X	X	X	X	X	X	*STUDYING*
					X		X		REVIEWING CLASS NOTES
					X		X	X	READING ASSIGNED MATERIALS
					X		X	X	READING RELEVANT MATERIALS
					X		X	X	COMPLETING ASSIGNED WORK
					X			X	*ALLOTTING STUDY TIME*
					X			X	SETTING A TIME FOR STUDY (1 HOUR PER DAY)
					X			X	STUDYING AT THE SAME TIME EACH DAY
					X			X	STUDYING ONE HOUR PER DAY
X					X	X		X	*OBTAINING ASSIGNED MATERIALS*
X									BUYING BOOKS, PENCILS, PAPER, ETC.
					X				CHECKING BOOKS OUT OF THE LIBRARY
X									GOING TO THE STORE FOR SUPPLIES
					X	X	X		*SPEAKING OUT IN CLASS*
					X	X	X		ATTENDING CLASS
					X	X	X		AWARENESS OF CLASSROOM ACTIVITIES
					X	X	X		LOOKING AT THE CLASS
					X	X	X		GETTING THE TEACHER'S ATTENTION
	X	X	X	X		X	X		HAND RAISING
						X	X	X	CALLING OUT
						X	X		*ATTENTIVENESS IN CLASS*
X	X	X	X	X	X	X	X	X	SITTING ERECT
X	X	X	X	X	X	X	X		LOOKING AT THE TEACHER
					X		X	X	WORKING QUIETLY AT DESK
X	X	X	X	X	X	X	X	X	SITTING QUIETLY
X	X	X	X	X		X	X	X	ASKING QUESTIONS
X	X	X	X	X		X	X	X	ANSWERING QUESTIONS
				X		X	X		WRITING ASSIGNMENTS IN CLASS
						X	X		*ATTENDING CLASS*
X				X		X	X		ARRIVAL ON TIME
STORE	OPPOSITE SEX	SAME SEX	PEER GROUP	SIBLINGS	LIBRARY	CHURCH	SCHOOL	HOME SETTING	

SYSTEMS-ANALYSIS OF SELF CONCEPT
ACADEMIC BEHAVIOR

LOCATION OR ENVIRONMENT									BEHAVIORS
						X	X		ENTERING THE CLASSROOM
X				X		X	X		SITTING DOWN
						X			*ATTENDING SCHOOL*
								X	GETTING UP IN THE MORNING
								X	DRESSING FOR SCHOOL
								X	LEAVING HOME
							X		ARRIVING ON THE SCHOOL GROUNDS
STORE	OPPOSITE SEX	SAME SEX	PEER GROUP	SIBLINGS	LIBRARY	CHURCH	SCHOOL	HOME SETTING	

SYSTEMS-ANALYSIS OF SELF-CONCEPT
ACADEMIC BEHAVIOR

SOURCE OF REWARDS FOR ADEQUATELY COMPLETING BEHAVIORS AT SCHOOL						*BEHAVIORS OCCURRING AT SCHOOL*
PRAISE FROM TEACHER	SOCIAL APPROVAL FROM PEERS	VALUED GRADES	ACCEPTANCE AND PRAISE OF PARENT	5¢ FOR EACH HOUR SPENT STUDYING	INTRINSIC SATISFACTION OF THE BEHAVIOR	
X			X			ARRIVAL ON SCHOOL GROUNDS
X			X			ARRIVAL ON TIME
X		X	X			ENTERING THE CLASSROOM
X		X				SITTING DOWN
X		X				SITTING QUIETLY
X		X				WORKING QUIETLY AT DESK
X	X	X				ASKING QUESTIONS
X	X	X				ANSWERING QUESTIONS
X	X	X				WRITING ASSIGNMENTS IN CLASS
X	X	X				LOOKING AT THE TEACHER
X						SITTING ERECT
X	X	X				ATTENDING CLASS
X	X	X				AWARENESS OF CLASSROOM ACTIVITY
X	X	X				LOOKING AT THE CLASS
X	X					GETTING THE TEACHER'S ATTENTION
X	X	X				HAND RAISING
X	X					CALLING OUT
X		X				REVIEWING NOTES AFTER CLASS
X		X				READING ASSIGNED MATERIALS
X		X				READING RELEVANT MATERIALS
X	X	X	X			COMPLETING ASSIGNED WORK
X	X	X	X			WRITING DOWN ASSIGNMENTS IN CLASS
X	X	X	X			GOING TO THE LIBRARY
X	X	X				FINDING BOOKS NEEDED
X	X	X				READING QUIETLY IN LIBRARY
X	X	X	X			OUTLINING MATERIALS
X	X	X	X			WRITING ANSWERS TO QUESTIONS ASKED

SYSTEMS-ANALYSIS OF SELF-CONCEPT
ACADEMIC BEHAVIOR

SOURCE OF REWARDS FOR ADEQUATELY COMPLETING BEHAVIORS AT HOME						*HOME SETTING*
						GETTING UP IN THE MORNING
				X	X	DRESSING FOR SCHOOL
				X	X	LEAVING HOME
				X	X	WORKING QUIETLY AT DESK
X				X	X	SITTING QUIETLY
X	X			X	X	ASKING QUESTIONS
X	X	X		X	X	ANSWERING QUESTIONS
X		X	X	X	X	SITTING ERECT
X						CALLING OUT
	X				X	OBTAINING ASSIGNED MATERIALS
X					X	SETTING A TIME FOR STUDY
X					X	STUDYING AT THE SAME TIME EACH DAY
X		X		X	X	STUDYING ONE HOUR PER DAY
X						REVIEWING CLASS NOTES
	X				X	READING ASSIGNED MATERIALS
X	X				X	READING RELEVANT MATERIALS
X	X	X			X	COMPLETING HOME WORK
X	X				X	WRITING DOWN ASSIGNMENTS IN CLASS
X	X				X	GOING TO THE LIBRARY
X					X	FINDING BOOKS NEEDED
X					X	OUTLINING MATERIALS
X	X				X	WRITING ANSWERS TO QUESTIONS
PRAISE FROM TEACHER	SOCIAL APPROVAL FROM PEERS	VALUED GRADES	ACCEPTANCE AND PRAISE OF PARENT	5¢ FOR EACH HOUR SPENT STUDYING	INTRINSIC SATISFACTION OF THE BEHAVIOR	

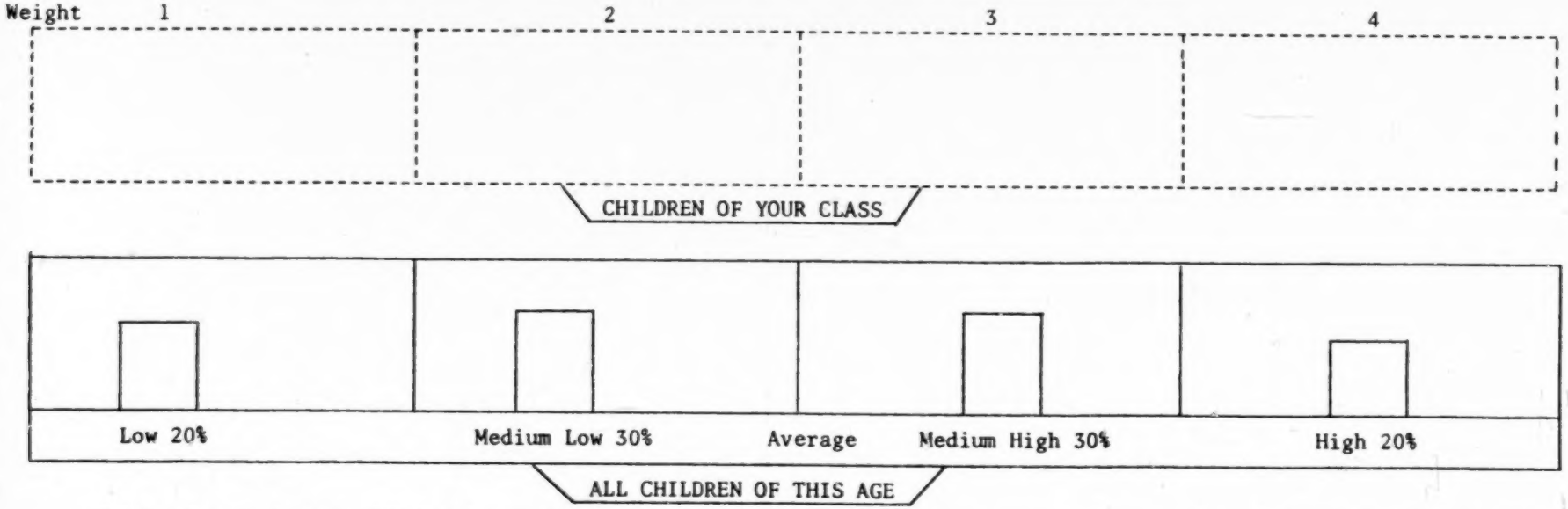
APPENDIX V

TEACHER FORCED RATING FORM

Date _____

Teacher _____ Intellectual Development

Children high on this dimension have good language development, do well (at their own level) in most schoolwork, have good ideas, can remember, learn, and apply information to new problems. Some may be creative, in the sense of having out-of-the-ordinary and perhaps original ideas. They can reason well for their age.



Think of your lowest child and your highest child on intellectual development; these will be the ends of your class scale. Write their names on your scale, then place the rest of the children also in the four groups which are roughly the size of the "all children" scale. For a class of 33, this would be approximately 6 or 7 children in the High Group, 9, 10, 11 in the Medium High and Medium Low, 6 or 7 in the Low Group. However, you may have slightly different numbers in these groups.

APPENDIX VI

I WILL INCREASE MY KNOWLEDGE

I PROMISE:

I will work hard with Mr. Beckum in his attempt to help me improve myself academically.

I will attend classes every day.

I will do my homework.

I will pay attention to what is going on in class.

I will try to develop study habits necessary to improve my learning.

_____

APPENDIX VII

WERE YOUR LEARNING ACTIVITIES

LAST NIGHT?

1. Did you do any studying last night? YES NO
2. Did you study math? YES NO
3. Did you study reading? YES NO
4. What time or times did you study? _____ _____ _____
5. Did you watch TV last night? YES NO
6. What TV shows did you watch? 1. _____
   2. _____ 3. _____
   4. _____ 5. _____
7. How long did you study reading? _____
8. What time did you study reading? _____
9. How long did you study math? _____
10. What time did you study math? _____
11. Did you study any other subjects? YES NO

APPENDIX VIII

THE ANALYSIS OF VARIANCE OF POSTTEST SCORES ON

SELF-CONCEPT, AND ACHIEVEMENT VARIABLES

Variables	Source	SS	DF	Mean Square	F
Total Self-Concept	Between	0.18	2	.09	0.26
	Within	13.55	38	.36	
	Total	13.74	40		
Academic Self-Concept	Between	0.19	2	0.10	0.23
	Within	15.95	38	0.42	
	Total	16.14	40		
Reading Vocabulary	Between	79.68	2	39.84	1.03
	Within	1393.55	36	38.71	
	Total	1473.23	38		
Reading Comprehension	Between	132.38	2	66.19	1.90
	Within	1285.59	37	34.75	
	Total	1417.97	39		
Reading Total	Between	382.60	2	191.30	1.76
	Within	3910.15	36	108.62	
	Total	4292.75	38		
Arithmetic Computation	Between	185.15	2	92.57	1.11
	Within	3081.95	37	83.30	
	Total	3267.10	39		
Arithmetic Concept	Between	111.75	2	55.88	2.56
	Within	807.84	37	21.83	
	Total	919.60	39		
Arithmetic Application	Between	25.05	2	12.52	1.64
	Within	274.69	36	7.63	
	Total	299.74	38		
Arithmetic Total	Between	572.93	2	286.46	1.41
	Within	7329.34	36	203.59	
	Total	7902.27	38		
Teacher Rating	Between	2.48	2	1.24	1.24
	Within	33.15	33	1.00	
	Total	35.64	35		

APPENDIX IX

TEST OF HOMOGENEITY OF VARIANCE

Table	F Max
Variables (Posttest)	
Total Self-Concept	
Group 1 compared with Group 2	2.03
Group 1 compared with Group 3	2.01
Group 2 compared with Group 3	1.01
Academic Self-Concept	
Group 1 compared with Group 2	3.39
Group 1 compared with Group 3	3.59
Group 2 compared with Group 3	1.06
Reading Vocabulary	
Group 1 compared with Group 2	1.97
Group 1 compared with Group 3	2.08
Group 2 compared with Group 3	1.05
Reading Comprehension	
Group 1 compared with Group 2	2.38
Group 1 compared with Group 3	2.68
Group 2 compared with Group 3	1.13
Reading Total	
Group 1 compared with Group 2	3.53
Group 1 compared with Group 3	3.70
Group 2 compared with Group 3	1.05
Arithmetic Computation	
Group 1 compared with Group 2	1.12
Group 1 compared with Group 3	2.74
Group 2 compared with Group 3	3.06

TEST OF HOMOGENEITY OF VARIANCE (Continued)

Table	F Max
Arithmetic Concept	
Group 1 compared with Group 2	1.86
Group 1 compared with Group 3	1.09
Group 2 compared with Group 3	2.03
Arithmetic Application	
Group 1 compared with Group 2	1.05
Group 1 compared with Group 3	2.00
Group 2 compared with Group 3	1.90
Arithmetic Total	
Group 1 compared with Group 2	1.06
Group 1 compared with Group 3	1.05
Group 2 compared with Group 3	1.01
Teacher Rating	
Group 1 compared with Group 2	1.17
Group 1 compared with Group 3	3.03
Group 2 compared with Group 3	3.55

APPENDIX X

CORRELATION MATRIX

	TOTSCPRE	ACASCPRE	RDVOCPRE	RDCOMPRE	RDTOTPRE	ARCOMPRE	ARCONPRE	ARAPPPRE	ARTOTPRE	TRAT PRE	TOTSCPOS	ACASCPOS	RDVOCPOS	RDCOMPOS	RDTOTPOS	ARCOMPOS	ARCONPOS	ARAPPPOS	ARTOTPOS	TRAT POS
TOTSCPRE	1.00	0.89	0.13	0.08	0.12	-.14	0.06	-.14	-.03	-.01	0.40	0.36	-.02	0.17	0.08	-.23	-.12	0.02	-.18	0.10
ACASPRE	0.89	1.00	0.11	0.06	0.09	-.13	0.03	-.17	.06	-.01	0.38	0.35	-.05	0.09	0.02	-.15	-.10	-.10	-.16	0.04
RDVOCPRE	0.13	0.11	1.00	0.54	0.86	0.40	0.59	0.54	0.54	0.23	0.07	-.00	0.58	0.25	0.49	0.44	0.38	0.15	0.45	0.02
RDCOMPRE	0.08	0.06	0.54	1.00	0.89	0.13	0.50	0.44	0.39	0.02	-.19	-.19	0.38	0.36	0.43	0.23	0.06	0.16	0.22	-.17
RDTOTPRE	0.12	0.09	0.86	0.89	1.00	0.29	0.60	0.54	0.51	0.15	-.07	-.12	0.54	0.35	0.52	0.38	0.24	0.18	0.38	-.10
ARCOMPRE	-.14	-.13	0.40	0.13	0.29	1.00	0.63	0.19	0.90	0.29	-.24	-.28	0.17	0.12	0.17	0.81	0.63	0.55	0.85	-.08
ARCONPRE	0.06	0.03	0.59	0.50	0.60	0.63	1.00	0.57	0.89	0.01	-.06	-.14	0.33	0.30	0.37	0.58	0.51	0.45	0.63	-.14
ARAPPPRE	-.14	-.17	0.54	0.44	0.54	0.19	0.57	1.00	0.54	0.10	-.14	-.25	0.50	0.17	0.40	0.38	0.28	0.24	0.38	0.11
ARTOTPRE	-.03	-.06	0.54	0.39	0.51	0.90	0.89	0.54	1.00	0.23	-.20	-.25	0.36	0.29	0.38	0.80	0.65	0.60	0.83	-.03
TRAT PRE	-.01	-.01	0.23	0.02	0.15	0.29	0.01	0.10	0.23	1.00	0.07	0.02	0.11	0.04	0.09	0.20	0.24	0.25	0.26	0.41
TOTSCPOS	0.40	0.38	0.07	-.19	-.07	-.24	-.06	-.14	-.20	0.07	1.00	0.96	0.13	0.20	0.19	-.18	-.16	-.07	0.18	0.15
ACASCPOS	0.36	0.35	-.00	-.19	-.12	-.28	-.14	-.25	-.25	0.02	0.96	1.00	0.15	0.22	0.21	-.18	-.24	-.10	0.21	0.20
RDVOCPOS	-.02	-.05	0.58	0.38	0.54	0.17	0.33	0.50	0.36	0.11	0.13	0.15	1.00	0.49	0.87	0.33	0.31	0.23	0.37	0.29
RDCOMPOS	0.17	0.09	0.25	0.36	0.35	0.12	0.30	0.17	0.29	0.04	0.20	0.22	0.49	1.00	0.86	0.17	0.35	0.37	0.32	0.28
RDTOTPOS	0.08	0.02	0.49	0.43	0.52	0.17	0.37	0.40	0.38	0.09	0.19	0.21	0.87	0.86	1.00	0.30	0.39	0.35	0.40	0.33
ARCOMPOS	-.23	-.15	0.44	0.23	0.38	0.81	0.58	0.38	0.80	0.20	-.18	-.18	0.33	0.17	0.30	1.00	0.61	0.43	0.93	-.00
ARCONPOS	-.12	-.10	0.38	0.06	0.24	0.63	0.51	0.28	0.65	0.24	-.16	-.24	0.31	0.35	0.39	0.61	1.00	0.49	0.82	0.13
ARAPPPOS	0.02	-.10	0.15	0.16	0.18	0.55	0.45	0.24	0.60	0.25	-.07	-.10	0.23	0.37	0.35	0.43	0.49	1.00	0.64	0.13
ARTOTPOS	-.18	-.16	0.45	0.22	0.38	0.85	0.63	0.38	0.83	0.26	-.18	-.21	0.37	0.32	0.40	0.93	0.82	0.64	1.00	0.06
TRAT POS	0.10	0.04	0.02	-.17	-.10	-.08	-.14	0.11	-.03	0.41	0.15	0.20	0.29	0.28	0.33	-.00	0.13	0.13	0.06	1.00

KEY:

TOTSCPRE = Total self-concept score on pretest
ACASCPRE = Academic self-concept score on pretest
RDVOCPRE = Reading vocabulary score on pretest
RDCOMPRE = Reading comprehension score on pretest
RDTOTPRE = Reading total score on pretest
ARCOMPRE = Arithmetic computation score on pretest
ARCONPRE = Arithmetic concept score on pretest
ARAPPPRE = Arithmetic application score on pretest
ARTOTPRE = Arithmetic total score on pretest
TRAT PRE = Teacher rating score on pretest

TOTSCPOS = Total self-concept score on posttest
ACASCPOS = Academic self-concept score on posttest
RDVOCPOS = Reading vocabulary score on posttest
RDCOMPOS = Reading comprehension score on posttest
RDTOTPOS = Reading total score on posttest
ARCOMPOS = Arithmetic computation score on posttest
ARCONPOS = Arithmetic concept score on posttest
ARAPPPOS = Arithmetic application score on posttest
ARTOTPOS = Arithmetic total score on posttest
TRAT POS = Teacher rating score on posttest

APPENDIX XI

CORRELATIONS AMONG PRETEST SCORES FOR GROUP I

N = 13

	Total Self-Concept Pre	Academic Self-Concept Pre	Reading Vocabulary Pre	Reading Comprehension Pre	Reading Total Pre	Arith Computation Pre	Arith Concept Pre	Arith Application Pre	Arith Total Pre	Teacher Rating Pre
Total S C Pre	1.00									
Academic S C Pre	.81	1.00								
Reading Vocab Pre	.23	.04	1.00							
Reading Comp Pre	.28	.07	.53	1.00						
Reading Total Pre	.29	.06	.86	.89	1.00					
Arith Comp Pre	-.01	.03	.41	.13	.30	1.00				
Arith Concept Pre	.14	-.09	.96	.75	.98	.54	1.00			
Arith App Pre	-.20	-.39	.58	.60	.68	.23	.71	1.00		
Arith Total Pre	.01	-.07	.77	.50	.72	.94	.83	.63	1.00	
Teacher Rating Pre	-.47	-.30	-.11	-.07	-.10	.68	.03	-.07	.50	1.00

APPENDIX XII

CORRELATIONS AMONG PRETEST SCORES FOR GROUP II

N = 15

	Total Self-Concept Pre	Academic Self-Concept Pre	Reading Vocabulary Pre	Reading Comprehension Pre	Reading Total Pre	Arith Computation Pre	Arith Concept Pre	Arith Application Pre	Arith Total Pre	Teacher Rating Pre
Total S C Pre	1.00									
Academic S C Pre	.90	1.00								
Reading Vocab Pre	-.23	-.08	1.00							
Reading Comp Pre	.17	.31	.67	1.00						
Reading Total Pre	-.04	.12	.94	.91	1.00					
Arith Comp Pre	-.24	-.10	.43	.33	.41	1.00				
Arith Concept Pre	.23	.27	.76	.70	.79	.74	1.00			
Arith App Pre	-.07	-.11	.69	.39	.58	.25	.68	1.00		
Arith Total Pre	.09	.11	.58	.51	.59	.94	.98	.58	1.00	
Teacher Rating Pre	-.16	-.09	.15	.13	.14	.06	.01	.12	.02	1.00

APPENDIX XIII

CORRELATIONS AMONG PRETEST SCORES FOR GROUP III

N = 14

	Total Self-Concept Pre	Academic Self-Concept Pre	Reading Vocabulary Pre	Reading Comprehension Pre	Reading Total Pre	Arith Computation Pre	Arith Concept Pre	Arith Application Pre	Arith Total Pre	Teacher Rating Pre
Total S C Pre	1.00									
Academic S C Pre	.91	1.00								
Reading Vocab Pre	.36	.30	1.00							
Reading Comp Pre	-.18	-.18	.45	1.00						
Reading Total Pre	.07	.04	.82	.88	1.00					
Arith Comp Pre	.01	-.19	.40	-.08	.16	1.00				
Arith Concept Pre	-.14	-.10	.30	.16	.26	.52	1.00			
Arith App Pre	-.17	-.06	.47	.48	.55	-.12	.28	1.00		
Arith Total Pre	-.09	-.20	.43	.22	.37	.81	.88	.23	1.00	
Teacher Rating Pre	.40	.20	.41	-.08	.17	.37	.01	.25	.21	1.00

APPENDIX XIV

CORRELATIONS AMONG POSTTEST SCORES FOR GROUP I

N = 13

	Total Self-Concept Post	Academic Self-Concept Post	Reading Vocabulary Post	Reading Comprehension Post	Reading Total Post	Arithmetic Computation Post	Arithmetic Concept Post	Arithmetic Application Post	Arithmetic Total Post	Teacher Rating Post
Total S C Post	1.00									
Academic S C Post	.91	1.00								
Reading Vocab Post	.55	.49	1.00							
Reading Comp Post	.08	-.10	.26	1.00						
Reading Total Post	.44	.30	.86	.72	1.00					
Arith Comp Post	.32	.43	.42	.17	.40	1.00				
Arith Concept Post	.01	.02	.26	.47	.43	.35	1.00			
Arith App Post	-.01	-.11	.35	.41	.47	.23	.67	1.00		
Arith Total Post	.26	.32	.50	.39	.57	.95	.71	.57	1.00	
Teacher Rating Post	-.22	-.18	-.36	.15	-.18	.29	.57	.71	.53	1.00

APPENDIX XV

CORRELATIONS AMONG POSTTEST SCORES FOR GROUP II

N = 15

	Total Self-Concept Post	Academic Self-Concept Post	Reading Vocabulary Post	Reading Comprehension Post	Reading Total Post	Arithmetic Computation Post	Arithmetic Concept Post	Arithmetic Application Post	Arithmetic Total Post	Teacher Rating Post
Total S C Post	1.00									
Academic S C Post	.98	1.00								
Reading Vocab Post	-.08	-.10	1.00							
Reading Comp Post	.45	.49	.33	1.00						
Reading Total Post	.22	.23	.82	.82	1.00					
Arith Comp Post	-.48	-.45	.46	.17	.39	1.00				
Arith Concept Post	-.35	-.39	.65	.33	.60	.77	1.00			
Arith App Post	-.47	-.47	.15	.33	.29	.56	.66	1.00		
Arith Total Post	-.49	-.48	.51	.27	.48	.96	.90	.72	1.00	
Teacher Rating Post	.18	.28	.37	.18	.34	-.25	-.13	-.45	-.27	1.00

APPENDIX XVI

CORRELATIONS AMONG POSTTEST SCORES FOR GROUP III

N = 14

	Total Self-Concept Post	Academic Self-Concept Post	Reading Vocabulary Post	Reading Comprehension Post	Reading Total Post	Arithmetic Computation Post	Arithmetic Concept Post	Arithmetic Application Post	Arithmetic Total Post	Teacher Rating Post
Total S C Post	1.00									
Academic S C Post	.96	1.00								
Reading Vocab Post	.11	.25	1.00							
Reading Comp Post	.14	.20	.71	1.00						
Reading Total Post	.12	.23	.91	.96	1.00					
Arith Comp Post	-.15	-.16	-.13	-.00	-.06	1.00				
Arith Concept Post	-.03	-.15	-.06	.17	.07	.58	1.00			
Arith App Post	.30	.31	.10	.49	.34	.39	.41	1.00		
Arith Total Post	-.04	-.10	-.08	.18	.07	.89	.85	.60	1.00	
Teacher Rating Post	.49	.47	.62	.46	.58	-.15	.16	.25	.04	1.00